DOCUMENT RESUME

ED 284 978 CE 047 951

AUTHOR Starr, Harold
TITLE Increasing Vocational Program Relevance: A Data-based Approach. Research and Development Series No. 264.
INSTITUTION Ohio State Univ., Columbus. National Center for Research in Vocational Education.
SPONS AGENCY Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE 87
CONTRACT 300-83-0016
NOTE 120p.
AVAILABLE FROM National Center Publications, Box F, National Center for Research in Vocational Education, 1960 Kenny Road, Columbus, OH 43210-1090 (Order No. RD264--$10.50).
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Computer Oriented Programs; *Data Analysis; Databases; *Data Interpretation; Evaluation Criteria; *Evaluation Methods; Microcomputers; Models; Needs Assessment; Norms; Outcomes of Education; Program Development; *Program Evaluation; Program Improvement; Relevance (Education); Secondary Education; Statewide Planning; *Statistical Analysis; *Vocational Education

ABSTRACT

This guide is intended for local- and state-level vocational education administrators, planners, and evaluators who are responsible for making program planning and evaluation findings and decisions geared toward increasing program relevance. The method differs from more traditional approaches in its heavy reliance upon the selection and application of quantitative as opposed to qualitative, judgmental, or intuitive data. Individuals using this evaluation method must (1) explicitly specify the relative importance they attribute to planning and evaluation components and to the kinds of data they select for use with the methodology and (2) value data quality. The introductory section of the guide includes an overview of the method, background information on the development of the method, and a description of the guide's intended audience. The second chapter covers design specifications, the procedures entailed in using the method (the information and data selection framework and the scoring and ranking processes used), and the role of the microcomputer in increasing the efficiency of the method's ranking process. The third section, which describes one example of implementation of the method, includes sections dealing with the following: site, ranking process, and grand labor market area context description (context for employment, employers' needs for workers, people's needs for jobs, and capacity to meet needs for training). Appendixes include examples of the following: information categories; performance indicators, measures, and scores; and databases and sources. (MN)

ED284978

Increasing Vocational Program Relevance: A Data-Based Approach

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

CE047951

THE NATIONAL CENTER
FOR RESEARCH IN VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY

BEST COPY AVAILABLE

THE NATIONAL CENTER MISSION STATEMENT

The National Center for Research in Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The National Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Providing information for national planning and policy
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

For further information contact:

Program Information Office
National Center for Research
in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210-1090

Telephone: (614) 486-3655 or (800) 848-4815
Cable: CTVOCEDOSU/Columbus, Ohio
Telex: 8104821894

Research and Development Series No. 264

Increasing Vocational Program Relevance: A Data-based Approach

Harold Starr

The National Center for Research in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210-1090
1987

Funding Information

Project Title:	The National Center for Research in Vocational Education, Evaluation
Contract Number:	300830016
Project Number:	055OC50010
Act under Which Funds Administered	Education Amendments 1976, P.L. 94-482
Source of Contract:	Office of Vocational and Adult Education U.S. Department of Education Washington, DC 20202
Contractor:	The National Center for Research in Vocational Education The Ohio State University Columbus, Ohio 43210-1090
Executive Director:	Robert E. Taylor
Disclaimer:	This publication was prepared pursuant to a contract with the Office of Vocational and Adult Education, U.S. Department of Education. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.
Discrimination Prohibited:	Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." Title IX of the Education Amendments of 1972 states: "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance." Therefore, the National Center for Research in Vocational Education Project, like every program or activity receiving financial assistance from the U.S. Department of Education, must be operated in compliance with these laws.

Table of Contents

LIST OF FIGURES, TABLES, AND EXHIBITS v

FOREWORD vii

EXECUTIVE SUMMARY ix

CHAPTER 1. INTRODUCTION 1

- Overview of the Method 2
- Background for the Development of the Method 2
- Intended Audience 4

CHAPTER 2. THE METHOD 5

- Design Specifications 5
- Description of the Method 7
  - The Information and Data Selection Framework 7
  - The Scoring Process 15
  - The Ranking Process 18
- Increased Ranking Process Efficiency by Using a Microcomputer 27

CHAPTER 3. IMPLEMENTING THE METHOD—AN EXAMPLE 31

- The Site 31
- The Ranking Process 38
- Grand Labor Market Area Context Description 38
  - Context for Employment 38
  - Employers' Needs for Workers 45
  - People's Needs for Jobs 47
  - Capacity to Meet Needs for Training 49

APPENDIX A. EXAMPLES OF INFORMATION CATEGORIES, PERFORMANCE INDICATORS, PERFORMANCE MEASURES, AND PERFORMANCE SCORES 51

APPENDIX B. EXAMPLES OF DATABASES AND SOURCES 75

APPENDIX C. MEMBERS OF THE REVIEW PANEL 103

REFERENCES 105

List of Figures, Tables, and Exhibits

Figure

1. Steps in implementing the method 3

Table

1. COMPARISON OF THREE METHODS 6

2. PATTERNS OF EMPLOYMENT BY OCCUPATIONAL GROUP, GRAND SMSA 46

3. AVERAGE ANNUAL OPENINGS 1985-1990 47

4. TOP 20 OCCUPATIONS—RATE OF GROWTH 48

Exhibit

1. INFORMATION SELECTION FRAMEWORK 9

2. PLANNING AND EVALUATION COMPONENTS 11

3. EXAMPLES OF INFORMATION CATEGORIES FOR THE FIVE PLANNING AND EVALUATION COMPONENTS 12

4. EXAMPLES OF PERFORMANCE INDICATORS FOR SELECTED INFORMATION CATEGORIES 13

5. EXAMPLES OF PERFORMANCE MEASURES FOR SELECTED PERFORMANCE INDICATORS 14

6. EXAMPLES OF PERFORMANCE MEASURES AND SCORES WHERE THE PASS/FAIL NORMALIZING PROCEDURE IS USED IN THE SCORING PROCESS 16

7. EXAMPLES OF PERFORMANCE MEASURES AND SCORES WHERE THE RANGE NORMALIZING PROCEDURE IS USED IN THE SCORING PROCESS 17

8. A SAMPLE RANKING PROCESS MATRIX 19

9. WEIGHTING PLANNING AND EVALUATION COMPONENTS 21

10. WEIGHTING INFORMATION CATEGORIES 22

11. WEIGHTING PERFORMANCE INDICATORS 23

12. WEIGHTING PERFORMANCE MEASURES 24

13. ADJUSTING NORMALIZED PERFORMANCE MEASURE SCORES FOR DATA QUALITY 26

14. RECOMPUTING NORMALIZED PERFORMANCE MEASURE SCORES AFTER ADJUSTMENTS FOR DATA QUALITY 28

15. LIST OF CANDIDATE OCCUPATIONS 33

16. LIST OF INFORMATION CATEGORIES, PERFORMANCE INDICATORS, AND PERFORMANCE MEASURES (AND SCORES) 34

17. SPREADSHEET DETAILING COMPUTATIONS AND RANKINGS—SET 1 39

18. SPREADSHEET DETAILING COMPUTATIONS AND RANKINGS—SET 2 42

Foreword

There continues to be a compelling need for methods that will enable vocational education providers to increase the relevance of vocational education programs in meeting employment needs of students, employers, and labor market areas. This publication describes a data- and value-driven program planning and evaluation method. When used for program planning, the method enables users to rank occupations in terms of their relevance in meeting employment needs and to consider the highest ranked occupations as the most appropriate ones for program development and implementation. When used for program evaluation, the method enables users to rank ongoing vocational education programs in terms of their relevance in meeting employment needs and to consider the lowest ranked programs as candidates for program improvement or consideration for termination.

The National Center is indebted to Harold Starr, who served as the project director and produced the report. He is a Senior Research Specialist in the Evaluation and Policy Division of the National Center. This division is directed by N. L. McCaslin, Associate Director.

Special appreciation is extended to David Stevens, Professor of Economics, the University of Missouri-Columbia, and Harold Carr, Superintendent, The Great Oaks Joint Vocational School District, Cincinnati, Ohio, for their expert reviews of the publication. A special note of thanks should be given to N. L. McCaslin, Associate Director; Paul Campbell, Steve Franchak, and Jay Smink, Senior Research Specialists; Allen Wiant, Research Specialist; and Harold Merz, Program Associate, all of the National Center, as well as to Tan Seng Hua, Manager of Planning, and Effie Lo Kuo, Manager of Research, the Vocational Industrial Training Board, the Republic of Singapore, for their advice and suggestions during the development of the method. These persons and their institutional affiliations are found in Appendix C.

Editorial review of the document was provided under the direction of Janet Kiplinger of the National Center. Marilyn Orlando served as secretary for the project and the publication was typed by Louise Pierson.

Funding for the study was provided by the Office of Vocational and Adult Education, U.S. Department of Education.

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

Executive Summary

This publication describes a program planning and evaluation method for increasing the relevance of vocational education offerings in meeting employment needs of students, employers, and labor market areas. Both quantitative data and explicit value judgements are used for comparing and ranking ongoing programs or candidate occupations.

The method is different from more traditional approaches in several ways. It relies heavily on selecting and applying quantitative as opposed to qualitative, judgmental, or intuitive data. However, the most notable differences are that users (1) **must explicitly specify the relative importance they attribute to planning and evaluation components (e.g., the employment context, educational process, benefits of vocational education) and to the kinds of data they select for use with the methodology** and (2) **must value data quality.**

Persons doing data-based planning and evaluation may find it very difficult to compare different kinds of useful data. For example, how can programs be compared when (1) program A has an 85 percent completion rate and a 63 percent placement rate, and there is an annual average demand for 1,132 persons in the occupation for which training is being offered, whereas (2) program B has a 93 percent completion rate and a 49 percent placement rate, and there is an annual average demand for 978 persons in the occupation. The question becomes how to use these different kinds of data to compare program A to program B to determine which is more relevant in meeting employment needs.

The program planning and evaluation method described in this publication provides a relatively simple way to compare data by using two data normalizing procedures. Data are given a score of either one or zero depending on whether they pass or fail a prespecified criterion; or data are scored on an arbitrary range (e.g. one to three points or one to five points) depending on multiple criteria set for each datum used in the planning or evaluation process. The method comprises three separate components: (1) an information and data selection framework, (2) a scoring process, and (3) a ranking process.

The information and data selection framework provides a procedure for systematically selecting appropriate quantitative data. The framework includes five steps. Users must first describe their planning or evaluation problem in some detail. This helps users to select data that are appropriate to the planning or evaluation task. Five components of a vocational education planning and evaluation process (employment context, vocational education process, outputs, outcomes, and benefits) are used as an organizing scheme for selecting data for use with the method. Next, users identify information categories for each component (e.g., supply/demand and employment conditions for the employment context component) and performance indicators for each information category (e.g., whether or not affirmative action is practiced by local employers in hiring for this occupation becomes a performance indicator for the information category of employment conditions). Finally, users prepare performance measures for each indicator, which are statements that lend themselves to quantification.

The steps required to implement the framework are explained in detail in this publication. Exhibits are used to depict the steps. In addition, two appendixes provide examples of information categories,

performance indicators, and performance measures as well as sources for obtaining program planning and evaluation data.

The scoring process requires two steps. First, a normalizing procedure is selected for use with the method. Then, performance measure statements are formatted to be compatible with the selected normalizing procedure.

The ranking process includes several steps. Users are shown how to (1) assign values (i.e., weightings of importance) to components of the framework; (2) adjust normalized data (performance measure) scores for their perceived quality; (3) multiply the weighting assigned to each performance measure by its adjusted normalized score (where applicable) and then add the recomputed scores for each candidate occupation (or occupational cluster) where the methodology is used for program planning or for ongoing offerings (or clusters) where the methodology is used for program evaluation; and (4) rank candidate occupations and ongoing programs based on the total recomputed score achieved by each.

The candidate occupations with the highest recomputed scores would, therefore, best meet employment needs and deserve consideration for program development and implementation. The ongoing offerings with the lowest recomputed scores would most need program improvement to increase relevance in meeting employment needs or be candidates for termination.

Different individuals or groups (e.g., educators and employers) may hold different values about the importance of planning and evaluation components and about the quality of data used. The method is designed to deal with this possibility by enabling users to examine the effects of differing sets of values on rankings. This enables them to test the consequences of different sets of values based on their assumptions about present and future employment, education, and economic conditions.

The ranking process can be used with a spreadsheet program and a microcomputer, which help users determine the effects on rankings if values are altered to satisfy group A or group B or if weightings are altered to reflect different assumptions about the future. A spreadsheet program can almost instantaneously compute new total scores and ranks of candidate occupations or ongoing programs as values (i.e., weightings of importance) are changed. Although the computation can be done manually, a spreadsheet program makes the ranking process easier.

There may be difficulties in implementing the method if administrators are not familiar with, or comfortable in using, quantitative data for program planning and evaluation. In such situations, it is highly likely that this publication alone will not be sufficient to enable them to implement the method. Instead, they may require some assistance or additional documentation. In other instances, school personnel may be ready to implement the method but may not have desirable data available. These issues are discussed in the body of the publication.

Although the method has not been field-tested, an external panel was asked to review it. The panel members found that it was conceptually sound and deserved consideration for implementation in vocational education institutions and agencies.

Chapter 1
Introduction

This publication describes a program planning and evaluation method designed to use quantitative data and explicit value judgements for accomplishing the following:

- Comparing and ranking candidate occupations being considered for program development and implementation in order to determine which of them best meet employment needs of students, employers, and labor markets areas

- Comparing and ranking ongoing vocational education programs to determine which of them most need improvement or should be considered for termination because they least meet employment needs

The method is intended to complement, rather than replace, traditional methods of planning and evaluating vocational education.

The National Center for Research in Vocational Education has completed a number of research and development projects that provide a better understanding of the progress and problems, nationally, associated with vocational education program planning and evaluation (e.g., Starr et al. 1976; Starr et al. 1979; Starr et al. 1980; Starr et al. 1981; Starr, Merz, and Zahniser 1982). One outcome of these National Center studies is the recognition that there continues to be a need by practitioners for planning and evaluation methods that make use of the best quantitative data available.

Vocational educators have not been overly enthusiastic about quantitative planning and evaluation methods. Instead, planning and evaluating methods have traditionally relied on expert judgments, observations, and intuition. Where differences of opinion exist about planning and evaluation findings, it is often uncertain whether such findings have resulted from differences among planners or evaluators with respect to their expertise or because they were looking at different things or the same things differently.

Federal vocational education legislation since 1963 has promoted the application of the best data available for planning and evaluation. In response, many state vocational education agencies and local education agencies and institutions have put in place more sophisticated management information systems. Nevertheless, quantitative data are still used more frequently for reporting purposes than for program planning and evaluation.

Part of the reason for the lack of data-based program planning and evaluation methods may be that many vocational education administrators are unsure about how to select, value, compare, and apply the different kinds of data available to them. The present method is specifically designed to deal with these four issues.

Among the characteristics that distinguish the present method from traditional ones are the following:

- It is data-based.
- A framework helps users select appropriate planning and evaluation data.
- Quantitative data can be compared by "normalizing" them. That is, regardless of their kind or actual extent, all data are scored with one or zero or a simple range of scores (e.g., one to three or one to five). The normalization process greatly simplifies comparisons of dissimilar data.
- Value judgments about the relative contribution of different kinds of data to the planning or evaluation process can be explicitly incorporated.
- Differences in the perceived quality of the selected data can be explicitly accounted for.
- Candidate occupations or ongoing vocational education offerings can be ranked, taking into account both quantitative but normalized data and their importance and quality. Thus, the present method is both data- and value-driven.
- Rankings can be established based on alternative sets of value judgments by different individuals or groups. Use of a microcomputer with spreadsheet software will enhance the speed of establishing rankings based on alternative sets of values.

Overview of the Method

The program planning and evaluation method consists of three components:

1. **An information and data selection framework** consisting of procedures for systematically selecting information and data that users may want to incorporate in the method for doing either planning or evaluation.
2. **A scoring process** that involves selecting a data-normalizing procedure and formatting compatible data descriptions.
3. **A ranking process** for determining which candidate occupations are best suited for program development and implementation and which ongoing programs should be considered for termination or improvement.

Figure 1 presents the steps required to implement the method. These steps will be explained in chapter 2.

Background for the Development of the Method

The method was developed in response to a continuing national intention for improved planning and evaluation in vocational education. This intention has been expressed in federal legislation since 1963 (i.e., the Vocational Education Act of 1963 and as subsequently amended, the vocational education provisions of the Education Amendments of 1976, and the Carl D. Perkins Vocational Education Act of 1984).

I. THE INFORMATION SELECTION FRAMEWORK

A. DEFINE THE PLANNING OR EVALUATION PROBLEM
   1. STATE THE MAJOR REASONS FOR DOING PLANNING OR EVALUATION
   2. FORMULATE A CONTEXT DESCRIPTION
      a. DESCRIBE ECONOMIC, SOCIAL, EDUCATIONAL, AND DEMOGRAPHIC CONDITIONS WITHIN THE LABOR MARKET AREA(S) BEING SERVED
      b. DESCRIBE INSTITUTIONAL RESOURCES, CAPABILITIES, AND CONSTRAINTS

B. LIST THE FIVE PLANNING AND EVALUATION COMPONENTS (e.g., EMPLOYMENT CONTEXT, VOCATIONAL EDUCATION PROCESSES)

C. SPECIFY INFORMATION CATEGORIES FOR EACH PLANNING AND EVALUATION COMPONENT (e.g., FOR THE EMPLOYMENT CONTEXT COMPONENT—EMPLOYMENT OPPORTUNITIES, EMPLOYMENT CONDITIONS)

D. ASSIGN ONE OR MORE PERFORMANCE INDICATORS TO EACH INFORMATION CATEGORY (e.g., FOR THE INFORMATION CATEGORY OF EMPLOYMENT OPPORTUNITIES—WHETHER CURRENT OR PROJECTED DEMAND FOR NEW WORKERS IN A CANDIDATE OCCUPATION IS SUFFICIENT FOR IMPLEMENTING A PROGRAM)

E. SELECT ONE OR MORE PERFORMANCE MEASURES FOR EACH PERFORMANCE INDICATOR (e.g., FOR THE INDICATOR "WHETHER CURRENT OR PROJECTED DEMAND FOR NEW WORKERS IN A CANDIDATE OCCUPATION IS SUFFICIENT FOR IMPLEMENTING A PROGRAM"—IF THIS CANDIDATE OCCUPATION IS/IS NOT AMONG THE 10 FASTEST-GROWING OCCUPATIONS IN THIS LABOR MARKET AREA)

II. THE SCORING PROCESS

A. SELECT A NORMALIZING PROCEDURE FOR COMPARING PERFORMANCE MEASURE DATA
   1. SELECT EITHER THE PASS/FAIL NORMALIZING PROCEDURE OR THE RANGE NORMALIZING PROCEDURE FOR SCORING PERFORMANCE MEASURES

B. PREPARE PERFORMANCE MEASURE STATEMENTS THAT ARE COMPATIBLE WITH THE SELECTED NORMALIZING PROCEDURE (E.G., FOR PASS/FAIL NORMALIZATION PROCEDURE—IF THIS CANDIDATE IS AMONG THE 10 FASTEST-GROWING OCCUPATIONS IN THIS LABOR MARKET AREA, SCORE 1; IF NOT, SCORE 0. FOR RANGE NORMALIZATION PROCEDURE—THIS CANDIDATE IS AMONG THE 10 FASTEST-GROWING OCCUPATIONS, SCORE 3; THIS CANDIDATE IS NOT AMONG THE 10 FASTEST-GROWING ONES, BUT IS EXHIBITING GROWTH, SCORE 2; THIS CANDIDATE'S PROJECTED RATE OF GROWTH IS EXPECTED TO BE CONSTANT OR ELSE DECLINE, SCORE 1)

III. THE RANKING PROCESS

A. CONSTRUCT RANKING MATRIX FORMAT
   1. SPECIFY ROW TITLES
   2. SPECIFY COLUMN TITLES
   3. LOCATE MATRIX CELLS (ONE CELL PER PERFORMANCE MEASURE)

B. IDENTIFY CANDIDATE OCCUPATIONS FOR PROGRAM PLANNING

Figure 1. Steps in implementing the method

C. IDENTIFY ONGOING PROGRAMS FOR PROGRAM EVALUATION

D. WEIGHT PLANNING OR EVALUATION COMPONENTS FOR RELATIVE IMPORTANCE (A VALUING PROCEDURE)

E. WEIGHT INFORMATION CATEGORIES (A VALUING PROCEDURE)

F. WEIGHT PERFORMANCE INDICATORS (A VALUING PROCEDURE)

G. WEIGHT PERFORMANCE MEASURES (A VALUING PROCEDURE)

H. ASSIGN NORMALIZED PERFORMANCE MEASURE SCORES TO CELLS OF MATRIX

I. ADJUST CELL SCORES FOR DATA INTEGRITY IF RANGE-NORMALIZING PROCEDURE HAS BEEN USED

J. RECOMPUTE NORMALIZED PERFORMANCE MEASURE SCORES ((WEIGHT FOR PERFORMANCE MEASURE) X (NORMALIZED SCORE ADJUSTED FOR UNADJUSTED FOR DATA INTEGRITY))

K. RANK CANDIDATE OCCUPATIONS OR ONGOING PROGRAMS
   1. TOTAL EACH ROW OF RECOMPUTED SCORES
   2. PLACE THESE ROW TOTALS IN DESCENDING ORDER IF RANKING CANDIDATES
   3. PLACE TOTALS IN ASCENDING ORDER IF RANKING ONGOING PROGRAMS

Figure 1. *Continued*

The design of the method was influenced by studies conducted by National Center staff and others (e.g., Young 1973; Drewes and Katz 1975; Starr et al. 1980; National Occupational Information Coordinating Committee 1981; Starr et al. 1981; Franchak 1983). These studies suggest that vocational education administrators do support planning and evaluation so that programs will better meet employment needs. However, uncertainty still exists about what kinds of data are most appropriate to use and how best to apply the imperfect data that are available.

Intended Audience

This publication has been prepared primarily for local- and state-level vocational education administrators, planners, and evaluators who must make program planning and evaluation findings and decisions. It is also directed to management information system administrators who seek to improve the usefulness of this information specifically for program planning and evaluation purposes. The method described in this publication is designed mainly for specialized or area schools offering vocational education, comprehensive high schools and postsecondary institutions with sufficient instructional offerings to require a vocational administrator, and state vocational education agencies.

Although the method has not been field-tested, an external panel did judgmentally assess it to suggest ways to improve its design and usefulness. The panel members found that it was conceptually sound and deserved consideration by vocational education administrators.

Chapter 2
The Method

Chapter 2 provides a description of the method. Specifications that guided its design are presented first and are followed by a description of the method's components and procedures for implementing them. Exhibits and appendixes are used to enable the reader to visualize how planning and evaluation information and data may be systematically selected and used with the method, how data are quantified, and how candidate occupations or ongoing vocational education programs are ranked.

Design Specifications

The six design specifications that guided the development of the method are as follows:

- Produce findings enabling vocational education administrators to make defensible, data-based decisions for increasing vocational education relevance in meeting the employment needs of students, employers, and labor market areas.
- Be applicable for both program planning and program evaluation.
- Rely heavily on data that are selected and manipulated systematically.
- Make explicit provisions for judging the importance and quality of data used with the method.
- Be suitable for implementation within state educational agencies and secondary and postsecondary schools that deliver vocational education under quite diverse employment, education, economic, demographic, and social contexts and constraints.
- Enable users to produce planning and evaluation findings based on different assumptions about present and anticipated employment and educational conditions. This capability is especially useful if planning and evaluation decisions are to be made by schools located in areas undergoing rapid or uncertain changes in demography, employment, or other conditions likely to affect the delivery of vocational education. Microcomputer technology will enhance efficiency in the implementation of this design specification.

The vocational education literature was reviewed to determine if there are any vocational education program planning and evaluation methods that already meet these six design specifications. None were found. Three methods were, however, identified that include approaches and techniques that could be extended, modified, or refined to meet the design specifications (Young 1973; Starr, Merz, and Zahniser 1982; and Michigan Vocational Education Resource Center n.d.). The

method described by the Michigan Vocational Education Resource Center appears to be a modification and application of program planning and evaluation techniques and approaches described by Young (1973) and by Starr, Merz, and Zahniser (1982). Table 1 depicts how well these three methods meet the six design specifications.

TABLE 1

COMPARISON OF THREE METHODS

Specification	Method		
	Young	Michigan V—T	Starr, Merz, and Zahniser
Designed specifically for relevance to employment needs	--	--	--
Applicable for program planning **and** evaluation	--	Yes	Yes
Data selected and manipulated systematically	--	--	--
Contains provisions for valuing data quality and importance	--	--	--
Designed for use under widest range of context conditions	--	Yes	Yes
Designed to accommodate different assumptions about present and future employment and education conditions	--	--	--

Description of the Method

The method includes three components: the information and data selection framework, the scoring process, and the ranking process. These components and their associated tasks are described next. The reader may find it useful to refer to figure 1 (chapter 1) to understand the method's components and their interrelationships.

I. The Information and Data Selection Framework (Steps I-A through I-E)

A framework has been developed to enable users to select information and data systematically for use with the program planning or evaluation method. This framework consists of five sequentially interrelated elements labeled as follows:

1. Purpose and problem
2. Planning and evaluation components
3. Information categories
4. Performance indicators
5. Performance measures

The following is a brief overview of the logic underlying the framework's development.

The method is used for increasing the relevance of vocational education programming in meeting employment needs. Its purpose requires users to be specific about the problem or need that requires implementing the method and to analyze and quantify those aspects of the employment and vocational education contexts and conditions related to the planning or evaluation problem. To simplify these requirements, an information and data selection framework has been developed.

A program planning or evaluation problem can, of course, be stated concisely or in detail, and this section of the publication describes the content that might be useful in both concise and comprehensive problem descriptions. A problem description should provide background information useful in identifying the data most applicable to the planning or evaluation problem.

This publication also provides a four-step procedure for arriving at the data that will be used to compare candidate occupations being considered for program development and implementation or to compare ongoing programs to determine which most need improvement or should be considered for termination. This four-step process considers the employment and education contexts and conditions that affect the relevance of candidate occupations or ongoing programs in meeting the employment needs of students, employers, and labor market areas.

When doing program planning and evaluation it is important to use information and data that describe (1) the employment context, (2) vocational education processes, (3) vocational education outputs, (4) vocational education outcomes, and (5) benefits from vocational education. Thus, the information and data selection framework consists of these five components and associated elements and subelements.

The first step requires users to select those components to be used in the information and data selection framework. In most instances, all five components will be used. If no information is available for a component, it will not be used.

The next three steps of the framework help establish the best available quantitative measures for each selected planning and evaluation component. These steps involve specifying (1) information categories for each component (e.g., employment supply and demand and employment conditions for the employment context component); (2) one or more performance indicators for each information category (e.g., the extent to which current demand exceeds available supply for the supply and demand category); and (3) performance measures, which are indicators transformed into a quantifiable format (e.g., whether the average annual number of job openings exceeds the number of completers from all public and private schools in the state offering training for this occupation as a measure of the demand and supply indicator).

Thus, users can select planning and evaluation data that have been logically derived from a presenting problem. Using this framework, therefore, provides a tool for systematically obtaining data for comparing candidate occupations and ongoing programs. Exhibit 1 depicts the location of the five elements in the information and data selection framework.

Each element includes other subelements that make up a complete information and data selection framework. These will be depicted in other exhibits as each element in the framework is discussed.

amework Element 1—Purpose and Problem (Steps I-A1 and I-A2)

As a first step in implementing the framework, users are encouraged to prepare a description of the specific problem that precipitated the need to increase the relevance of vocational education in meeting employment needs. A description of the program planning or evaluation problem provides a useful foundation for the following:

- Determining the criteria (performances) that should be used to compare candidate occupations or ongoing vocational education instructional programs
- Selecting criterion measures (performance measures) that are appropriate and meaningful with respect to the planning or evaluation problem

Users may want to consider the following when describing a planning or evaluation problem:

- Explaining why administrators or planners in the secondary school, postsecondary institution, or state office believe it is necessary to increase overall vocational education program relevance to meet employment needs

EXHIBIT 1

INFORMATION SELECTION FRAMEWORK

Purpose (and Problem)	Planning and Evaluation Components	Information Categories	Performance Indicators	Performance Measures
P L A N N I N G o r E V A L U A T I O N				

- Describing economic, social, educational, and demographic conditions within the primary labor market area served by the school system that should be considered when attempting to increase the relevance of vocational education to meet employment needs

- Summarizing institutional resources, capabilities, and constraints that are likely to effect a change in the number of vocational education offerings currently being offered

Formulating a context description (sometimes called an environmental scan) can be helpful in describing demographic, social, economic, employment, and educational conditions that should be considered when dealing with a particular planning or evaluation problem. Chapter 3 provides an example of a context description.[1]

[1]This context description is a modification of one found in Starr, Merz, and Zahniser (1982, pp. 16-31).

An example of a program planning need would be deciding on the most relevant vocational education programs for skilled workers who have lost their jobs because of technological changes in production methods or because their firms are moving to new locations and the present labor market area is experiencing very high unemployment. Program evaluation needs include deciding which ongoing vocational education programs continue to be most and least relevant for high school students entering an expanding employment market in which fewer but better paying jobs are available in industrial occupations and many more but lower paying jobs are being created in service occupations.

In both examples, the employment needs of students, employers, and labor market areas are quite different. Therefore, the criteria (performances) and criterion (performance) measures used to compare candidate occupations and ongoing vocational education offerings will likely be somewhat different.

Framework Element 2—Planning and Evaluation Components (Step I-B)

The second element in the framework consists of the following five program components:[2]

- **Employment context** includes the educational, employment, economic, and demographic conditions and constraints within the labor market areas being served by a school's vocational education program that affect, or are likely to affect, the relevance of vocational offerings in meeting employment needs.

- **Vocational education processes** are student and instructional characteristics that affect, or are likely to affect, vocational program operation and the success of these offerings in meeting employment needs.

- **Vocational education outputs** are the number of persons who graduate or complete programs and achieve their skill levels.

- **Vocational education outcomes** apply to the employment-related consequences of vocational education (e.g., training-related placement rates and job-search time).

- **Benefits from vocational education** are the contributions of vocational education to individuals, the economy, and society.

These five program planning and evaluation components are used in the framework to help derive and specify information categories. Exhibit 2 depicts the placement of the five program planning and evaluation components within the framework.

[2]Ibid., chapter 2.

EXHIBIT 2

PLANNING AND EVALUATION COMPONENTS

Purpose (and Problem)	Planning and Evaluation Components	Information Categories	Performance Indicators	Performance Measures
P L A N N I N G or E V A L U A T I O N	Employment *Context* Vocational Education *Processes* Vocational Education *Outputs* Vocational Education *Outcomes* *Benefits* from Vocational Education			

Framework Element 3—Information Categories (Step I-C)

The third element of the framework consists of information categories for each of the five program planning and evaluation components. Just as these components serve as an organizing framework for deriving and specifying information categories, the latter are used to select the performance indicators (Step I-D) that measure if, or the extent to which, candidate occupations or ongoing vocational education offerings meet employment needs.

Information categories are best understood by examining some examples. Examples for each of the five program planning and evaluation components are found in exhibit 3. An extended list of information categories is found in appendix A. Users of the method may choose from among the information categories listed in exhibit 3 and appendix A, modify the categories, or formulate their own.

Using the example of program planning for displaced workers presented under element 1 of the framework and the information categories listed in exhibit 3, many users of the method may consider **job opportunities** as being more important than **employment conditions**. The reverse will probably

EXHIBIT 3

EXAMPLES OF INFORMATION CATEGORIES FOR THE FIVE PLANNING AND EVALUATION COMPONENTS

Purpose (and Problem)	Planning and Evaluation Components	Information Categories	Performance Indicators	Performance Measures
P L A N N I N G	Context	• Job Opportunities • Employment Conditions		
	Processes	• Staffing • Facilities • Dollars • Curriculum		
	Output	• Potential Output		
	Benefits	• Economic/Social Benefits		

hold true if secondary-level students will be entering an emerging service-oriented local economy as described in element 1. The way in which the program planning and evaluation method deals with differences in importance that users assign to information categories is explained in this chapter under the ranking process.

Framework Element 4—Performance Indicators (Step I-D)

One or more performance indicators must be assigned to each information category selected for use. Performance indicators can perhaps be best understood by studying examples of them in relationship to information categories. Some examples can be found in exhibit 4. An extended list appears in appendix A. Users of the method may choose from among the performance indicators listed in exhibit 4 and appendix A, modify the categories, or formulate their own.

Formulating the best and the optimum number of performance indicators will require experience. Like information categories, the most pertinent performance indicators will be highly dependent on the previously developed description of the problem and will also be constrained by the availability of timely and pertinent data for measuring performance achievement.

Performance indicators, like information categories, may be considered by a user as having different levels of importance. The procedures for dealing with the relative importance of performance indicators is explained in this chapter under the ranking process.

EXHIBIT 4

EXAMPLES OF PERFORMANCE INDICATORS FOR SELECTED INFORMATION CATEGORIES

Purpose (and Problem)	Planning and Evaluation Components	Information Categories	Performance Indicators	Performance Measures
P L A N N I N G	Context	Job Opportunities	Whether current demand for new workers in this occupation is sufficient to warrant implementing a program to prepare persons for this occupation	
		Conditions of Employment	Whether the principles of affirmative action in hiring persons for this occupation are practiced by employers in this labor market area	

Framework Element 5—Performance Measures (Step I-E)

One or more performance measures may be associated with each performance indicator. The application of multiple performance measures in scoring and ranking candidate occupations or ongoing vocational education offerings is also explained in this chapter under the scoring and ranking processes.

Performance measure data can take a variety of forms (e.g., numbers, ratios, trends, discriminating values, or ranks). There are no specific rules for establishing the best or optimum number of performance measures for any set of performance indicators. In general, it should be easier to select appropriate performance measures where an educational agency has a research department or well-developed management information system, and when users gain experience in implementing

and operating the method and in gauging the credibility, availability, and stability of various performance measures.

Exhibit 5 gives examples of performance measures for selected performance indicators. An extended set can be found in appendix A. Sources for performance measures are found in appendix B. Users may choose or modify these examples or formulate their own. To give the reader a clearer understanding of a total framework, appendix A contains the five elements of the information selection framework.

First-time users of the method may find that particular performance measures deemed highly desirable are simply unavailable when they are needed (e.g., measures dealing with employer satisfaction with trainee performance or the dropout rate from programs being evaluated). However, an awareness that certain data would be very useful for program planning or program evaluation may stimulate the collection of such data for use in subsequent implementations.

EXHIBIT 5

EXAMPLES OF PERFORMANCE MEASURES FOR SELECTED PERFORMANCE INDICATORS

Purpose (and Problem)	Planning and Evaluation Components	Information Categories	Performance Indicators	Performance Measures
P L A N N I N G	Employment Context	Job Opportunities	Whether the rate of growth for new workers in this occupation is sufficient to warrant implementing a program	If this occupation is/is not among the 10 (or some other user-specified number) fastest growing occupations in this labor market area (or the state or nation if local data are unavailable)
			Whether future demand for new workers in this occupation is sufficient to warrant implementing a program	If the estimated number of job openings in this occupation during the next 12 months (or some other time frame) in this labor market area is/is not greater than the estimated number of program completers from all programs that prepare persons for this occupation in this labor market area (or in several contiguous labor market areas)

II. The Scoring Process (Steps II-A and II-B)

Selecting a Normalizing Procedure (Step II-A)

Just as scores on dissimilar tests can be compared using centiles, quartiles, stanines, and the like, some way must be found to compare seemingly dissimilar performance measure data. Such comparisons can be accomplished by normalizing performance measure data.

This can be done in at least two ways. Each performance measure can be scored on whether or not a particular performance level has been achieved. If this normalizing procedure is selected, each performance measure will be assigned a pass or fail score (i.e., a performance measure score of one to zero). Performance measures can also be scored on the relative extent to which performance has been achieved. If this procedure for normalizing is selected, each performance measure will have a score that falls somewhere within the same common range of scores (e.g., a range of one to three, a range of one to five).

Both procedures are applicable for use with the method. For convenience, the first will be labeled the pass/fail normalizing procedure and the second will be labeled the range normalizing procedure.

The range normalizing procedure may be easier to implement than the pass/fail procedure by first-time method users because of the inherent difficulties of establishing and justifying levels of performance that discriminate between passing and failing. Starr, Merz, and Zahniser (1982) discuss examples from Young (1973) and from their own work of applying the two types of normalizing procedures (although they label them differently).

Preparing Performance Measure Statements for Compatibility With a Normalizing Procedure (Step II-B)

Exhibits 6 and 7 provide examples of both procedures for scoring performance measures. Exhibit 6 contains examples of performance measures formatted for use with the pass/fail procedure, whereas exhibit 7 contains examples for use with the range procedure. More extensive examples of formatted performance measures as well as performance measure scores using the two normalizing procedures are found in appendix A.

EXHIBIT 6

EXAMPLES OF PERFORMANCE MEASURES AND SCORES WHERE THE PASS/FAIL NORMALIZING PROCEDURE IS USED IN THE SCORING PROCESS

Purpose (and Problem)	Planning and Evaluation Components	Information Categories	Performance Indicators	Performance Measures and Scores
	Employment Context	Job Opportunities	Whether the rate of growth for new workers in this occupation is sufficient to warrant implementing a program	1 If the reported average annual number of job openings in this occupation is greater than the number of completers in the past 12 months (or other specified time frame) from all programs in this labor market area (or statewide) that prepare persons for this occupation 0 If the reported average annual number of job openings in this occupation is less than or equal to the number of completers in the past 12 months (or some other user-specified time frame) from all programs in this labor market area (or statewide) that prepare persons for this occupation

EXHIBIT 7

EXAMPLES OF PERFORMANCE MEASURES AND SCORES WHERE THE RANGE NORMALIZING PROCEDURE IS USED WITH THE SCORING PROCESS

Purpose (and Problem)	Planning and Evaluation Components	Information Categories	Performance Indicators	Performance Measures and Scores
E V A L U A T I O N	Employment context	Job opportunities	Whether the rate of growth for new workers in this occupation is sufficient for implementing a program	**3** If the reported average annual number of job openings in the occupation for which students are being trained is greater than the number of completers from all programs of this kind in the past 12 months **2** If the reported average annual number of job openings is equal to or very nearly equal to the number of completers in the past 12 months **1** If the reported average annual number of job openings is less than the number of completers in the past 12 months

III. The Ranking Process (Steps III-A through III-K)

The ranking process consists of several procedures that culminate in ranking candidate occupations or vocational education offerings. The rankings provide method users with a data-based and rationalized foundation for making decisions about which instructional programs to implement and which ongoing offerings to improve or terminate in order to increase total vocational education program relevance in meeting employment needs.

In implementing this process, it is necessary to construct a ranking process matrix (Step III-A). Exhibit 8 depicts the row and column format for the matrix.

Identifying Candidate Occupations or Vocational Education Offerings (Steps III-B or III-C)

The program planning and evaluation method requires users to identify a set of candidate occupations that should be considered for program development and implementation or a set of ongoing vocational education instructional programs to be evaluated for program improvement or termination.

Users can consult several sources, including trade associations, unions, professional groups, the state's employment services agency, and the local advisory committee for vocational education, to obtain a list of candidate occupations (Step III-B). These sources could be supplied with selection criteria to aid them in recommending candidates. Sample selection criteria might include that (1) a candidate occupation require formal training (but less than a college degree) by persons seeking entry-level employment and (2) a significant number of people are likely to be employed in the candidate occupation in various state or local labor market areas.

Selecting ongoing vocational education programs or program clusters for evaluation (Step III-C) can be done in several ways. An administrator could select a sample (e.g., 20 percent of all programs) and evaluate them once each year, or evaluate specific programs or program clusters if local employers or other groups are concerned about whether particular instructional programs meet employment needs of students, employers, or the local labor market area.

Procedures for Valuing (Steps III-D through III-G)

Since the method is value-driven, users must carry out a set of procedures for (1) weighting the relative importance of planning and evaluation components, information categories, performance indicators, and performance measures and (2) modifying normalized performance measure scores to reflect these weightings. Different sets of weightings are likely to result in different rankings for candidate occupation or ongoing vocational education programs. The procedures for weighting or valuing are described next.

EXHIBIT 8

A SAMPLE RANKING PROCESS MATRIX

Planning and Evaluation Components	**Context**		**Process**					**Outcome**	**Benefits**
Weight for Importance	40.0		30.0					15.0	15.0
Information Categories	**Job Opportunities**	**Employment Conditions**	**Staffing**	**Dollars**	**Facilities**	**Student Interest**	**Training Availability**	**Placement**	**Economic Benefits**
Weight for Importance	25.0	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Indicators	1 (2) 2	3 (1)	4 (1)	5 (1)	6 (1)	7 (1)	8 (1)	9 (1)	10 (1)
Weight for Importance	12.5 12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Measures	a a	a	a	a	a	a	a	a	a
Performance Weight	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0

NOTE: To save space, the output component has been omitted in exhibits 8-12.

Weighting Planning and Evaluation Components (Step III-D).

One way to approach this task is to assume that the sum of the weightings for the set of components must equal 100 points. If all components are judged equally important, each component weighting equals 100 divided by the number of components. If all 5 components are used when implementing the method, each receives 20 points (i.e., 100/5 = 20). If some planning and evaluation components are judged more important than others, then a proportion of the 100-point total is assigned to each (e.g., 20 points, 30 points, 15 points, 10 points, and 25 points, respectively). Exhibit 9 depicts this weighting scheme.

Weighting Information Categories for Importance (Step III-E).

One or more information categories will be associated with each planning and evaluation component. If there is only one information category within a component, that category receives the same weight as the component. If there are two or more, the following weighting scheme is recommended. If all categories are considered equally important, the weight assigned to each is derived by dividing the component weight by the number of information categories (e.g., if the component weight equals 30 points and there are 3 information categories, each receives 10 points). On the other hand, if a user decides that the categories are not equally important, the categories would be assigned a proportion of the points assigned to their respective component (e.g., if the component weight equals 30 points and there are 3 information categories, the category weights might be 10 points, 15 points, and 5 points or perhaps 15 points, 7.5 points, and 7.5 points). This weighting scheme is depicted in exhibit 10.

Weighting Performance Indicators (Step III-F).

Each information category will have one or more associated performance indicators. If there is only one, it receives the same weight as the category. If there are two or more indicators within a category, the following weighting scheme is recommended. If all performance indicators within the information category are considered equally important, the weight assigned to each is derived by dividing the category weight by the number of performance indicators (e.g., if the information category weight equals 10 points and there are 2 performance indicators, each indicator receives 5 points). On the other hand, if a user decides that the indicators are not equally important, they receive a proportion of the points assigned to their respective category (e.g., if the category weight equals 10 points and there are 2 performance indicators, the indicator weights might be 8 points and 2 points or perhaps 4 points and 6 points). This weighting scheme is depicted in exhibit 11.

Weighting Performance Measures (Step III-G).

Each performance indicator will have one or more associated performance measures. If there is only one, it receives the same weight as the indicator. If there are two or more, the following weighting scheme is recommended. If all measures are considered equally important, the weight assigned to each is derived by dividing the performance indicator weight by the number of performance measures (e.g., if the performance indicator weight equals 15 points and there are 2 performance measures, each receives 7.5 points). If the 2 measures are valued differently, their combined point total must equal the performance indicator weighting (e.g., if the performance indicator weight is 15, the 2 measures might receive 5 points and 10 points, respectively). Exhibit 12 depicts this weighting scheme.

EXHIBIT 9

WEIGHTING PLANNING AND EVALUATION COMPONENTS

Planning and Evaluation Components	Context		Process						Outcome	Benefits
Weight for Importance	40.0		30.0						15.0	15.0
Information Categories	Job Opportunities		Employment Conditions	Staffing	Dollars	Facilities	Student Interest	Training Availability	Placement	Economic Benefits
Weight for Importance	25.0		15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Indicators	1 (2)	2	3 (1)	4 (1)	5 (1)	6 (1)	7 (1)	8 (1)	9 (1)	10 (1)
Weight for Importance	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Measures	a	a	a	a	a	a	a	a	a	a
Performance Weight	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0

EXHIBIT 10

WEIGHTING INFORMATION CATEGORIED

Planning and Evaluation Components	Context		Process					Outcome	Benefits
Weight for Importance	40.0		30.0					15.0	15.0
Information Categories	**Job Opportunities**	**Employment Conditions**	**Staffing**	**Dollars**	**Facilities**	**Student Interest**	**Training Availability**	**Placement**	**Economic Benefits**
Weight for Importance	25.0	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Indicators	1 (2) 2	3 (1)	4 (1)	5 (1)	6 (1)	7 (1)	8 (1)	9 (1)	10 (1)
Weight for Importance	12.5 12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Measures	a a	a	a	a	a	a	a	a	a
Performance Weight	12.5 12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0

EXHIBIT 11

WEIGHTING PERFORMANCE INDICATORS

Planning and Evaluation Components	Context		Process						Outcome	Benefits
Weight for Importance	40.0		30.0						15.0	15.0
Information Categories	**Job Opportunities**		**Employment Conditions**	**Staffing**	**Dollars**	**Facilities**	**Student Interest**	**Training Availability**	**Placement**	**Economic Benefits**
Weight for Importance	25.0		15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Indicators	1 (2)	2	3 (1)	4 (1)	5 (1)	6 (1)	7 (1)	8 (1)	9 (1)	10 (1)
Weight for Importance	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Measures	a	a	a	a	a	a	a	a	a	a
Performance Weight	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0

EXHIBIT 12

WEIGHTING PERFORMANCE MEASURES

Planning and Evaluation Components	**Context**			**Process**					**Outcome**	**Benefits**
Weight for Importance	40.0			30.0					15.0	15.0
Information Categories	**Job Opportunities**		**Employment Conditions**	**Staffing**	**Dollars**	**Facilities**	**Student Interest**	**Training Availability**	**Placement**	**Economic Benefits**
Weight for Importance	25.0		15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Indicators	1 (2)	2	3 (1)	4 (1)	5 (1)	6 (1)	7 (1)	8 (1)	9 (1)	10 (1)
Weight for Importance	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0
Performance Measures	a	a	a	a	a	a	a	a	a	a
Performance Weight	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0

Assigning Normalized Performance Measure Scores to Cells (Step III-H)

For each candidate occupation or ongoing vocational education program, there will be one normalized performance measure score per performance measure. The ranking process matrix contains one cell per performance measure score. If the pass/fail normalizing procedure has been used with the method, each matrix cell will be assigned a score of zero or one. If the range normalizing procedure has been used, each cell will receive a score from one to the specified upper end of the measurement range (e.g., three, four, or five).

Adjusting Normalized Performance Measure Scores for Data Quality (Step III-I)

Users may consider data used to produce normalized performance measure scores completely acceptable. However, this is sometimes not the case. There are times when employment, education, demographic, and economic data may be considered less than completely acceptable because of questionable credibility, reliability, or accuracy. In such cases, the data quality can be considered as being impaired.

Adjusting normalized performance measure scores for data quality is only appropriate when the range normalizing procedure is used. When the pass/fail normalizing procedure is used, no corrections for data quality should be made. When performance measure scores have been generated using the pass/fail normalizing procedure, the quality of performance data should be considered fully acceptable. Scores represent performances that either have or have not been achieved; there is no range of scores. However, if corrections for data quality were permitted, pass/fail values would, in effect, be converted to a range of scores.

Applying Weightings to Account for Differences in Data Quality.

If the range normalizing procedure has been used and the option to adjust normalized scores for data quality is elected, users may assign a value of parity or equivalence to the scores when there are no serious doubts about the quality of the data used to generate them and reduce them by fixed amounts depending on their adjudged degree of impairment. An example follows. Reduce obtained normalized performance measure scores for data quality—

- by 0.1 if performance measure data reliability, accuracy, or credibility seems to be only mildly suspect;
- by 0.2 if performance measure data reliability, accuracy, or credibility seems to be moderately suspect;
- by 0.3 if performance measure data reliability, accuracy, or credibility seems to be marginally passable.

It would not be advisable to adjust normalized performance measure scores for data quality unless users are knowledgeable about the particular data being used for scoring. Data should not be used with the method if they are believed to be really "bad." Exhibit 13 depicts normalized performance measure scores adjusted for data quality.

EXHIBIT 13

ADJUSTING NORMALIZED PERFORMANCE MEASURE SCORES FOR DATA QUALITY

Planning and Evaluation Components	Context		Process					Outcome	Benefits	
Weight for Importance	40.0		30.0					15.0	15.0	
Information Categories	**Job Opportunities**	**Employment Conditions**	**Staffing**	**Dollars**	**Facilities**	**Student Interest**	**Training Availability**	**Placement**	**Economic Benefits**	
Weight for Importance	25.0	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0	
Performance Indicators	1 (2)	2 3 (1)	4 (1)	5 (1)	6 (1)	7 (1)	8 (1)	9 (1)	10 (1)	
Weight for Importance	12.5	12.5 15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0	
Performance Measures	a	a a	a	a	a	a	a	a	a	
Performance Weight	12.5	12.5 15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0	
Machinist Technician										Sum
(normalized)	2.0	2.0 2.0	3.0	1.0	2.0	2.0	2.0	3.0	2.0	
(adjusted)	1.8	2.0 2.0	3.0	1.0	2.0	1.9	2.0	3.0	2.0	
(recomputed)	22.5	25.0 30.0	15.0	10.0	10.0	9.5	10.0	45.0	30.0	207.0

Recomputing Normalized Performance Measure Scores for Weightings of Importance (Step III-J)

The normalized performance measure scores, adjusted or unadjusted for data quality, must now be recomputed to reflect the values (weightings of importance) assigned to planning and evaluation components, information categories, performance indicators, and performance measures. The simplest way is to multiply each normalized performance measure score, adjusted or unadjusted for data quality, by its corresponding performance measure weight. The recomputation process is depicted in exhibit 14.

Ranking Candidate Occupations or Ongoing Programs (Step III-K1 and III-K2)

The last steps in the process include ranking candidate occupations or ongoing vocational offerings.

Ranking Candidate Occupations.

Each row of recomputed cell scores should be summed (Step III-K2), which produces a total row score for each candidate occupation. The totals for all candidate occupations should be placed in descending order (Step III-K2). Those occupations with the highest totals would be selected as being most relevant for meeting employment needs and thus as most appropriate for program development and implementation. This ranking procedure is depicted in exhibits 17 and 18 in chapter 3.

Ranking Ongoing Programs.

Each row of recomputed cell scores should be summed (Step III-K1), producing a total score for each vocational education program being evaluated for relevance in meeting employment needs. The totals for all these programs should be placed in ascending order (Step III-K3). The programs with the lowest totals would be considered least relevant for meeting employment needs and therefore most in need of program improvement or consideration for termination.

Increased Ranking Process Efficiency by Using a Microcomputer

The ranking process can be made more efficient by using a microcomputer and a spreadsheet program, which creates a matrix on a microcomputer monitor. The matrix consists of rows, columns, and cells. Users fill these with labels, numbers, or text.

Planning and evaluation components, information categories, performance indicators, and performance measures as well as the weights for the importance of each element can be entered on the monitor screen in the columns of the matrix. Candidate occupations or ongoing vocational education offerings can be entered in the rows of the matrix. Normalized, adjusted, and recomputed performance measure scores can be entered in the cells that correspond to their proper candidate and performance measure intersections.

EXHIBIT 14

RECOMPUTING NORMALIZED PERFORMANCE MEASURE SCORES AFTER ADJUSTMENTS FOR DATA QUALITY

Planning and Evaluation Components	Context			Process					Outcome	Benefits	
Weight for Importance	40.0			30.0					15.0	15.0	
Information Categories	Job Opportunities		Employment Conditions	Staffing	Dollars	Facilities	Student Interest	Training Availability	Placement	Economic Benefits	
Weight for Importance	25.0		15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0	
Performance Indicators	1 (2)	2	3 (1)	4 (1)	5 (1)	6 (1)	7 (1)	8 (1)	9 (1)	10 (1)	
Weight for Importance	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0	
Performance Measures	a	a	a	a	a	a	a	a	a	a	
Performance Weight	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0	
Machinist Technician											Sum
(normalized)	2.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	3.0	2.0	
(adjusted)	1.8	2.0	2.0	3.0	1.0	2.0	1.9	2.0	3.0	2.0	
(recomputed)*	22.5	25.0	30.0	15.0	10.0	10.0	9.5	10.0	45.0	30.0	207.0

*Recomputed cell score = (performance weight X (adjusted cell score). In the event adjustments for data quality are not made, the recomputed cell score = (performance weight) X (normalized performance measure score).

Algebraic formulas and statistical functions can be assigned to cells to (1) automatically recompute all normalized performance measure scores whenever levels of importance assigned to planning and evaluation components, information categories, performance indicators, or performance measures change and (2) compute new row totals for all candidate occupations or ongoing programs. These formulas and functions can recalculate the contents of specific cells, rows of cells, or columns of cells. Recalculated totals can be further directed by appropriate spreadsheet program commands to be reordered in ascending or descending order.

A spreadsheet program helps with the scoring process especially when users are uncertain or differ in opinion about the weightings of importance that should be assigned to planning and evaluation components, information categories, performance indicators, and performance measures. Users may also want to reweight (revalue) these elements based on alternate assumptions about employment needs as these may exist in the next 5 or 10 years. Using a spreadsheet program and microcomputer can speed up the recalculation process required by any revaluing. Chapter 3 discusses applying a spreadsheet program to the ranking process.

Chapter 3
Implementing the Method—An Example

Chapter 3 illustrates use of the method for doing program planning at the local level. The example uses the range normalizing procedure. An example for evaluating ongoing instructional programs by using the pass/fail normalizing procedure is not included to avoid presenting more detail than is necessary.

The Site

The planning and evaluation method will be implemented at Grand Community College. The college, one of the state's many publicly supported postsecondary institutions, is located in Expansion City, the major population center in Grand County. About 80 percent of the college's students are enrolled in vocational education programs.

This institution regularly offers several technology programs. Graduates of these programs receive an associate degree. The college also offers a variety of vocational education programs that lead to a certificate of completion. Some of these programs are offered on a regular basis, whereas others are offered only as the need arises (e.g., in response to a firm's request to prepare, retrain, or upgrade employees).

Grand Community College receives about 45 percent of its operating funds from the county, about 30 percent from students' tuition, and about 25 percent from the State Board for Postsecondary Education. The bulk of the college's funding is from local sources; therefore, the community expects that vocational-technical programs will mainly serve the Grand labor market area.

Several recent actions by the governor's office and the state legislature have been directed toward improving employment training responsiveness in meeting state and local employment and economic needs. Members of the state legislature are on record as supporting postsecondary education institutions providing the kinds of trained workers that will induce manufacturing and service firms to maintain, relocate, or begin operations in the state. The State Board for Postsecondary Education has responded to the legislative concern by requesting that all publicly supported community colleges and technical institutes determine what new vocational education programs should be offered in their labor market areas to increase responsiveness to economic development needs.

These events led the governing board of Grand Community College to urge the school's president to determine what new vocational education programs will best meet local resident and potential

employers needs. The president notified the dean of occupational education about the governing board's concerns and the need for immediate action. Subsequently, the dean selected a program planning team that included college staff and persons from the community (e.g., employers and members of the local economic development council).

At its first meeting, the team reviewed the circumstances leading to its appointment. The dean of occupational education, chairperson of the team, pointed out that Grand Community College has always engaged in formal planning before implementing new occupational education programs. For example, occupational education staff always consult with a local advisory committee composed of representatives of local area firms before implementing new occupational programs. In addition, the staff have conducted numerous surveys of employers and adults to determine what kinds of occupational education programs are desired in the local labor market area.

Some of the team's members voiced concerns about relying so heavily on advice from advisory committees and data from employment surveys because employers' expressed opinions of needs for trained workers might be overly self-serving or might be based on different sets of assumptions about the economy and the availability of adequately trained workers. Since team members would not be aware of these assumptions, the advice received and the data obtained could not be properly interpreted. Other team members stated that previous program planning methods were more than acceptable.

In view of these contrasting views, the dean suggested that the team consider using a program planning and evaluation method described in a publication issued by the National Center for Research in Vocational Education at The Ohio State University. If they were not satisfied with that method, the team could fall back on surveys or advice from an advisory committee. The team agreed to review documentation describing the method.

After reading the documentation, some team members voiced a concern that it was untested, complex, and potentially difficult to implement. They did agree, however, that the method had some noteworthy features. In the end, the team elected to adopt the method described in the National Center publication.

At a subsequent planning team meeting, the dean appointed a subcommittee to formulate a more complete description of the planning problem given to them. A context description, which is suggested for use with the method, was not available. Therefore, the subcommittee decided to develop one. A copy of the *Grand Labor Market Area Context Description* is reproduced at the end of this chapter.

The team's next problem was to identify a set of candidate occupations to be considered for program development and implementation. It was decided that a group of persons not connected with the team should be appointed for this purpose. The dean contacted the director of the local economic development council, the executive director of the local chamber of commerce, and three persons involved in professional and trade associations and requested that they serve as an ad hoc committee.

The ad hoc committee members were informed of their responsibility for nominating candidate occupations. These persons were further informed that the list of candidate occupations should include those (1) found in at least four fields of interest to vocational education (e.g., health, commerce, construction, and technology), (2) found in both the manufacturing and service sectors, and (3) determined to be either new or emerging in the local labor market area or to have potential economic development consequences (i.e., the presence of adequate numbers of trained workers in

these occupations might induce firms to locate in this labor market area or keep local firms from relocating or closing).

The president of the community college added one more criterion for selecting candidate occupations: Some must be occupations for which disadvantaged students can be trained (even if the college must provide compensatory education courses). The ad hoc committee members agreed that this issue had to be addressed, given the comments about disadvantaged groups mentioned in the context description and the fact that Grand Community College is committed to serving the educationally disadvantaged. They completed their deliberations and presented the planning team with a list of candidate occupations (exhibit 15).

EXHIBIT 15

LIST OF CANDIDATE OCCUPATIONS

1. Machinist technician
2. Automotive technician
3. Data processing machine repairer
4. Word processor operator
5. Lab technician (medical)
6. Salesperson (retail)
7. Electronic technician

The planning team then turned its attention to determining systematically what kinds of information to use with the method. A subcommittee was appointed by the dean to carry out this task. They began by studying examples of information categories, performance indicators, and performance measures found in appendix A of the publication describing the method. The subcommittee then met with the college's management information system director and subsequently with staff from the local office of the state employment services agency to ascertain the availability and quality of various education and employment data.

The subcommittee members learned that some desired data required to measure the relevance of candidate occupations in meeting employment needs could not be secured from the state employment services agency, the state departments of education or postsecondary education, or the college's management information system unit. They also found out that not all available education, employment, and labor market information was of equal quality.

The subcommittee reviewed the planning problem, the context description, and the data constraints described in the meeting with the management information director and the staff from the employment services agency. They were able to agree about the specific planning and evaluation components, information categories, performance indicators, performance measures, and the normalizing procedure that should be used with the method. Exhibit 16 contains the subcommittee's recommendations as approved by the team.

EXHIBIT 16

LIST OF INFORMATION CATEGORIES, PERFORMANCE INDICATORS, AND PERFORMANCE MEASURES (AND SCORES)

Information Categories	Performance Indicators	Performance Measures (and Scores)
Job Opportunities	(1) The extent of the growth rate of this occupation	(a) **3** If this occupation is among the 10 fastest-growing occupations in this labor market area
		2 If this occupation is not among the 10 fastest-growing ones, but is exhibiting growth
		1 If this occupation's projected rate of growth is expected to be constant or else decline
	(2) The extent to which future demand for workers is great enough to consider implementing a program	(a) **3** If the average annual number of job openings is greater than the number of completers in the past 12 months from all known programs in this labor market area preparing persons for this occupation
		2 If the average annual number of job openings is less than or equal to the number of completers in the past 12 months from all known programs in this labor market area preparing persons for this occupation
		1 If the number of completers is unknown
		(b) **3** If national growth prospects for this occupation are considered above average
		2 If national growth prospects for this occupation are considered average or below average
		1 If growth prospects are unreported

EXHIBIT 16—*Continued*

Information Categories	Performance Indicators	Performance Measures (and Scores)
Conditions of Employment	(3) The extent to which employers practice affirmative action in hiring persons for this occupation	(a) **3** If there is evidence that most employers hiring persons for this occupation do not discriminate against minorities or the economically disadvantaged **2** If there is evidence that most employers do discriminate **1** If affirmative action practices are unknown
Staffing	(4) The extent to which staff can be made available to teach the skills required in preparing persons for this occupation	(a) **3** If there are staff who can be assigned without compromising any ongoing programs **2** If there are staff who can be assigned but it means that 1 or more programs will be affected to some extent **1** If no staff are currently available and recruitment is uncertain
Dollars	(5) The extent to which costs are acceptable	(a) **3** If the recurrent cost is likely to be less than the median of recurrent costs for continuing programs at this school **2** If the recurrent cost is likely to equal or exceed the median of recurrent costs for continuing programs at this school **1** If the recurrent cost cannot be estimated at this time

EXHIBIT 16—*Continued*

Information Categories	Performance Indicators	Performance Measures (and Scores)
Facilities	(6) The extent to which space needed for instruction to train persons for this occupation is acceptable	(a) **3** If less space would be required than the median space used for other continuing programs in this school **2** If space required would be equal to or greater than the median space used for other continuing programs **1** If space required by the candidate cannot be estimated at this time
Student Interest	(7) The extent to which there is likely to be sufficient enrollment to justify implementing a program to prepare persons for this occupation	(a) **3** If there is a trend toward increased enrollments statewide in programs to prepare persons for this occupation **2** If enrollments statewide have remained essentially stable **1** If enrollments are declining
Placement	(8) The extent to which program graduates find training-specific or training-related jobs	(a) **3** If the placement rate exceeds the state average for this type of program by +1 standard deviation **2** If the placement rate for this type of program, statewide, is within +1 and -1 standard deviations **1** If the placement rate for this type of program, statewide, is more than -1 standard deviation

EXHIBIT 16—*Continued*

Information Categories	Performance Indicators	Performance Measures (and Scores)
Availability of Training Opportunities	(9) The extent to which training is offered by other schools in this labor market area	(a) **3** If there are no other schools in this area offering a program to prepare persons for this occupation **2** If there is only 1 other school in this area offering training for this occupation **1** If several schools in this area offer training for this occupation
Economic Benefits	(10) The extent to which the availability of a program to train persons for this occupation is likely to be an incentive in interesting firms to either relocate here or remain in this area	(a) **3** If the local economic development agency has received 5 or more inquiries about the availability of such training during the past 12 months **2** If the local economic development agency has received from 1 to 4 inquiries during the past 12 months **1** If the local economic development agency has received no inquiries during the past 12 months

The Ranking Process

The team nominated the dean and the management information system unit director to implement the ranking process. Available data were assembled and normalized scores were assigned to each performance measure. Since the range normalization procedure was being used, they decided to correct performance measure scores for data quality, which drew no adverse comments from other team members.

Business and industry team members vehemently disagreed, however, with the members representing the education community about the weightings of importance that the dean and the management information system director assigned to some of the planning and evaluation components. The business and industry representatives concluded that the context description pointed out the need to score the employment context component higher than the education-related components. The educators on the team held just the opposite point of view.

After a lively debate, it was agreed that there should be two different sets of weightings of importance for planning and evaluation components, that statements should be prepared describing the rationale for the two different sets of weightings, and that the ranking process should be implemented twice to produce two rankings of the candidate occupations. The team agreed to provide the college's president with this information and to let that individual decide which of the two rankings would be most acceptable.

The National Center report indicated that a spreadsheet program could hasten the ranking process when more than one set of weightings was being considered. However, since there were only two rankings to be performed, manually computing rankings seemed more efficient than using a spreadsheet program, which takes time to set up. Members of the team were interested, however, in testing the efficiency of using a spreadsheet program because the president and the governing board would probably want to include their own assumptions and judgments about weightings for importance and adjustments for data quality.

The director of the management information system unit brought in a spreadsheet program and a microcomputer, set up the spreadsheet matrix to duplicate the elements of the ranking process matrix, and entered cell scores, formulas, and functions as appropriate. The director ran the spreadsheet program after inserting the two alternative sets of weightings. Exhibits 17 and 18 depict the results. Note that in this situation, the two sets of weightings did alter the rankings somewhat. However, the top two occupations kept their rankings. Most team members saw the value in using a spreadsheet computer program to test the impact of different weighting scenarios.

Grand Labor Market Area Context Description

Context for Employment

Expansion City, a community of 135,000 persons, is the county seat of Grand County. Grand County and the two adjacent counties of Terrific and Moreso form the Grand standard metropolitan statistical area (SMSA). Grand SMSA has a population of approximately 315,000. Terrific and Moreso Counties are primarily residential in nature; Grand County (and especially Expansion City) is the site of the majority of jobs in the SMSA.

EXHIBIT 17

SPREADSHEET DETAILING COMPUTATIONS AND RANKINGS—SET 1

Planning and Evaluation Components	Context		Process						Outcome	Benefits	
Weight for Importance	40.0		30.0						15.0	15.0	
Information Categories	Job Opportunities	Employment Conditions	Staffing	Dollars	Facilities	Student Interest	Training Availability		Placement	Economic Benefits	
Weight for Importance	25.0	15.0	5.0	10.0	5.0	5.0	5.0		15.0	15.0	
Performance Indicators	1 (2)	2	3 (1)	4 (1)	5 (1)	6 (1)	7 (1)	8 (1)	9 (1)	10 (1)	
Weight for Importance	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0	
Performance Measures	a	a	a	a	a	a	a	a	a	a	
Performance Weight	12.5	12.5	15.0	5.0	10.0	5.0	5.0	5.0	15.0	15.0	
Machinist Technician											Sum
(normalized)	2.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	3.0	2.0	
(adjusted)	1.8	2.0	2.0	3.0	1.0	2.0	1.9	2.0	3.0	2.0	
(recomputed)*	22.5	25.0	30.0	15.0	10.0	10.0	9.5	10.0	45.0	30.0	207.0

*Recomputed cell score = (Performance weight X (adjusted cell score). In the event adjustments for data quality are not made, the recomputed cell score = (performance weight) X (normalized performance measure score).

EXHIBIT 17—*Continued*

Automotive Technician											
(normalized)	1.0	2.0	2.0	3.0	2.0	1.0	2.0	2.0	1.0	2.0	
(adjusted)	0.8	2.0	2.0	3.0	2.0	1.0	1.9	2.0	1.0	2.0	
(recomputed)	10.0	25.0	30.0	15.0	20.0	5.0	9.5	10.0	15.0	30.0	169.5
Computer Programmer											
(normalized)	2.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	2.0	2.0	
(adjusted)	1.8	3.0	2.0	3.0	3.0	1.0	1.9	3.0	2.0	2.0	
(recomputed)	22.5	37.5	30.0	15.0	30.0	5.0	9.5	15.0	30.0	30.0	224.5
Word Processor											
(normalized)	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	1.0	
(adjusted)	1.8	2.0	2.0	1.0	1.0	2.0	1.9	1.0	2.0	1.0	
(recomputed)	22.5	25.0	30.0	5.0	10.0	10.0	9.5	5.0	30.0	15.0	162.0
Medical Lab Technician											
(normalized)	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	
(adjusted)	1.8	2.0	2.0	2.0	3.0	2.0	1.9	2.0	2.0	2.0	
(recomputed)	22.5	25.0	30.0	10.0	30.0	10.0	9.5	10.0	30.0	30.0	207.0
Salesperson—retail											
(normalized)	3.0	2.0	3.0	2.0	3.0	2.0	1.0	2.0	1.0	1.0	
(adjusted)	2.8	2.0	3.0	2.0	3.0	2.0	0.9	2.0	1.0	1.0	
(recomputed)	35.0	25.0	45.0	10.0	30.0	10.0	4.5	10.0	15.0	15.0	199.0

EXHIBIT 17—*Continued*

Electronic Technician											
(normalized)	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	3.0	
(adjusted)	1.8	3.0	2.0	3.0	2.0	2.0	2.9	2.0	3.0	3.0	
(recomputed)	22.5	37.5	30.0	15.0	20.0	10.0	14.5	10.0	45.0	45.0	249.5

Performance Indicators	Performance Measures
1. Extent of rate of growth	a. Fastest growing
2. Extent of future demand	a. Average annual openings
3. Extent of affirmative action	a. Evidence of nondiscrimination
4. Extent to which staff are available	a. Current and potential availability
5. Acceptability of costs	a. Comparison of recurrent costs with other programs, locally
6. Extent to which space is acceptable	a. Comparison of space needs to other programs
7. Extent to which enrollments likely to be sufficient	a. Enrollment trends, statewide
8. Extent to which training offered by other sources	a. Other schools in LMA offering training for occupation
9. Extent of placement in occupation for which trained	a. Comparison of placement rates for similar programs, statewide
10. Extent of incentive for economic development purpose	a. Number of inquiries about training availability

RANK ORDER	SUM	OCCUPATION
1	249.5	Electronic technician
2	224.5	Computer programmer
3	207.0	Machinist technician
4	207.0	Medical lab technician
5	199.5	Salesperson (retail)
6	169.5	Automotive technician
7	162.0	Word processor

EXHIBIT 18

SPREADSHEET DETAILING OCCUPATIONS AND RANKINGS—SET 2

Planning and Evaluation Components	Context		Process						Outcome	Benefits	
Weight for Importance	30.0		40.0						15.0	15.0	
Information Categories	Job Opportunities	Employment Conditions	Staffing	Dollars	Facilities	Student Interest	Training Availability		Placement	Economic Benefits	
Weight for Importance	20.0	10.0	5.0	20.0	5.0	5.0	5.0		15.0	15.0	
Performance Indicators	1 (2)	2	3 (1)	4 (1)	5 (1)	6 (1)	7 (1)	8 (1)	9 (1)	10 (1)	
Weight for Importance	10.0	10.0	10.0	5.0	20.0	5.0	5.0	5.0	15.0	15.0	
Performance Measures	a	a	a	a	a	a	a	a	a	a	
Performance Weight	10.0	10.0	10.0	5.0	20.0	5.0	5.0	5.0	15.0	15.0	
Machinist Technician											Sum
(normalized)	2.0	2.0	2.0	3.0	1.0	2.0	2.0	2.0	3.0	2.0	
(adjusted)	1.8	2.0	2.0	3.0	1.0	2.0	1.9	2.0	3.0	2.0	
(recomputed)*	18.0	20.0	20.0	15.0	20.0	10.0	9.5	10.0	45.0	30.0	197.5

*Recomputed cell score = (Performance weight X (adjusted cell score). In the event adjustments for data quality are not made, the recomputed cell score = (performance weight) X (normalized performance measure score).

EXHIBIT 18—*Continued*

Automotive Technician											
(normalized)	1.0	2.0	2.0	3.0	2.0	1.0	2.0	2.0	1.0	2.0	
(adjusted)	0.8	2.0	2.0	3.0	2.0	1.0	1.9	2.0	1.0	2.0	
(recomputed)	8.0	20.0	20.0	15.0	40.0	5.0	9.5	10.0	15.0	30.0	172.5
Computer Programmer											
(normalized)	2.0	3.0	2.0	3.0	3.0	1.0	2.0	3.0	2.0	2.0	
(adjusted)	1.8	3.0	2.0	3.0	3.0	1.0	1.9	3.0	2.0	2.0	
(recomputed)	18.0	30.0	20.0	15.0	60.0	5.0	9.5	15.0	30.0	30.0	232.5
Word Processor											
(normalized)	2.0	2.0	2.0	1.0	1.0	2.0	2.0	1.0	2.0	1.0	
(adjusted)	1.8	2.0	2.0	1.0	1.0	2.0	1.9	1.0	2.0	1.0	
(recomputed)	18.0	20.0	20.0	5.0	20.0	10.0	9.5	5.0	30.0	15.0	152.5
Medical Lab Technician											
(normalized)	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	
(adjusted)	1.8	2.0	2.0	2.0	3.0	2.0	1.9	2.0	2.0	2.0	
(recomputed)	18.0	20.0	20.0	10.0	60.0	10.0	9.5	10.0	30.0	30.0	217.5
Salesperson—retail											
(normalized)	3.0	2.0	3.0	2.0	3.0	2.0	1.0	2.0	1.0	1.0	
(adjusted)	2.8	2.0	3.0	2.0	3.0	2.0	0.9	2.0	1.0	1.0	
(recomputed)	28.0	20.0	30.0	10.0	60.0	10.0	4.5	10.0	15.0	15.0	202.5

EXHIBIT 18—*Continued*

Electronic Technician											
(normalized)	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	3.0	
(adjusted)	1.8	3.0	2.0	3.0	2.0	2.0	2.9	2.0	3.0	3.0	
(recomputed)	18.0	30.0	20.0	15.0	40.0	10.0	14.5	10.0	45.0	45.0	247.5

Performance Indicators	Performance Measures
1. Extent of rate of growth	a. Fastest growing
2. Extent of future demand	a. Average annual openings
3. Extent of affirmative action	a. Evidence of nondiscrimination
4. Extent to which staff are available	a. Current and potential availability
5. Acceptability of costs	a. Comparison of recurrent costs with other programs, locally
6. Extent to which space is acceptable	a. Comparison of space needs to other programs
7. Extent to which enrollments likely to be sufficient	a. Enrollment trends, statewide
8. Extent to which training offered by other sources	a. Other schools in LMA offering training for occupation
9. Extent of placement in occupation for which trained	a. Comparison of placement rates for similar programs, statewide
10. Extent of incentive for economic development purpose	a. Number of inquiries about training availability

RANK ORDER	SUM	OCCUPATION
1	247.5	Electronic technician
2	232.5	Computer programmer
3	217.5	Medical lab technician
4	202.5	Salesperson (retail)
5	197.5	Machinist technician
6	172.5	Automotive technician
7	152.5	Word processor

Between 1975 and 1985, the population in the SMSA expanded rapidly. It is estimated that the population in the SMSA grew at an average rate of 4.5 percent per year over the past decade as compared to an average rate of 4.1 percent for the state and 2.4 percent for the nation as a whole. This growth in the population of the SMSA is attributed primarily to the fact that many out-of-state persons moved into the area. It is believed that this expansion in population will exceed an annual average of 5 percent during the next several years.

An increasingly larger proportion of the SMSA population falls into the 15- to 24-year-old age group, resulting in more pressure on the local educational agencies. At the same time, employers are finding that there are increasing numbers of persons available to enter the work force.

The Grand SMSA work force grew at an average annual rate of 4.8 percent over the last 5 years. There is a noticeable migration of both workers and firms into the region. The creation of new jobs has kept pace with the increase in people seeking work, and as a result, unemployment is currently around 6.7 percent. This rate contrasts with the current state unemployment rate of 8.2 percent and the current national unemployment rate of 6.9 percent. Unemployment in the Grand SMSA has remained consistently below the state and national levels during most of the past decade.

Labor is relatively inexpensive in the SMSA. For example, the average wage of production workers is $7.23 per hour. This figure compares to the national average wage of $8.61 per hour and to the state average wage of $7.47 per hour for production workers. Many firms have migrated to the area to take advantage of the supply of less expensive workers. Also, the pleasant climate and recreational opportunities have made it easy for firms to attract professional, managerial, and technical employees from across the nation.

Many motels, restaurants, and retail stores that cater to an expanding tourist trade are located in the Grand SMSA, especially in Expansion City and its immediate surroundings. These businesses employ a major proportion of persons in the Grand SMSA work force. However, the levels of employment in many of these businesses are subject to fluctuations because the tourist trade is seasonal in nature. These businesses, especially the restaurants and motels, use proportionately more unskilled labor than do other industries in the area. However, the presence of a sizable number of unskilled and undereducated persons in the area does provide a pool of available workers for businesses catering to the tourist trade.

Employment in the manufacturing sector is experiencing a steady growth. Aerospace, electronic, and glass firms employ the majority of employees in manufacturing. The growth of manufacturing in the SMSA is related to low energy costs, as well as to the availability of low-cost and reliable labor.

Employers' Needs for Workers

The Grand SMSA has 467 employers who employ three or more persons. These 467 employers provide 89 percent of the jobs in the SMSA. The majority of employees are in the manufacturing, services, government, and wholesale and retail industries. The remainder are employed in transportation, communications, construction, finance, insurance, real estate, and agriculture.

The pattern of employment by industrial division in the Grand SMSA affects the distribution of occupational groups in this labor market area. Table 2 lists nine occupational groups and indicates the distribution of employment by groups for the SMSA and for the state. Concentration indices and estimates of growth and decline for each occupational grouping are also included.

TABLE 2
PATTERNS OF EMPLOYMENT BY OCCUPATIONAL GROUP, GRAND SMSA

Occupational Group	Percentage of Total Employment			Concentration Indexes		Growth Predicted to 1990
	Local	Statewide	National	Local/State	Local/National	
Professional/ Technical Workers	12	14	16	.86	.75	55%
Managers, Officials, Proprietors	13	12	11	1.08	1.18	48%
Sales Workers	9	9	6	1.00	1.50	32%
Clerical Workers	20	18	18	1.11	1.11	66%
Crafts and Kindred Workers	11	10	13	1.10	.85	28%
Operatives	12	14	15	.86	.80	36%
Service Workers	18	16	14	1.12	1.29	71%
Laborers (nonfarm)	4	4	4	1.00	1.00	29%
Farm Workers	1	3	3	.33	.33	-8% (45% average of all occupations)

NOTE: Patterns of employment for occupations typically described in State Employment Security Agency publications, which report occupational employment projections, both statewide and for selected labor market areas of a state. This information is sometimes found in the Annual Planning Report, which is also issued by this agency. Concentration indexes can be calculated by the education agency.

Table 3 lists 19 specific occupations that require less than a community college degree as a prerequisite for employment and that are expected to have more than 100 job openings per year in the SMSA through 1990.

TABLE 3

AVERAGE ANNUAL OPENINGS 1985-1990

Occupations	Average Annual Openings	Occupations	Average Annual Openings
Secretaries	1,608	Carpenters/Apprentices	173
Sales Workers	1,192	Packers/Wrappers	151
Waiters/Waitresses	874	Heavy Equipment Mechanics	138
Cashiers	647	Licensed Practical Nurses	135
Bookkeepers	483	Guards	134
Truck Drivers	324	Delivery Route Workers	123
Typists	297	Auto Mechanics/ Apprentices	119
Cooks	261	Receptionists	107
Assemblers	234		
Machine Operators	198		
Checkers/Examiners, Mfg.	180		

NOTE: Average annual job openings for many occupations are presented in State Employment Security Agency publications that report occupational employment projections, both statewide and for selected labor market areas of a state. This kind of information may also be found in the Annual Planning Report that is issued by this agency.

Table 4 rank orders the 20 occupations in the SMSA that are expected to have the highest rates of growth for the 1985-1990 period. It should be noted that some of the occupations with high rates of growth have comparatively few average annual openings. This is understandable because relatively few persons are employed in these particular occupations. For example, although the rate of growth of opticians and lens grinders is 117 percent, the average annual number of openings is only 14. This is because there are currently only 274 opticians and lens grinders in the SMSA.

People's Needs for Jobs

There is little information available about what kinds of training are desired by the population of the SMSA. On the other hand, there is information that suggests that certain groups in the community have not shared in its economic growth. For example, about 13 percent of all persons in Grand are considered to be living at or below the poverty level. Approximately two-thirds of these persons are nonwhites. The active file of the local state employment service office indicates that of those persons in this group who are seeking employment, more than 80 percent are on welfare. In addition, few applicants from this group of persons seem to find continuous substantial gainful employment even if they are referred to an employer. The facts indicate that the poor in the area are much more likely to be

TABLE 4

TOP 20 OCCUPATIONS—RATE OF GROWTH

Occupations	Estimated Rate of Growth 1985-90 (as a percentage)	Average Annual Openings
Dental Hygienists	300	47
Data Processing Machine Repairers	236	32
Clerical Assistants	200	12
Child Care Workers	186	84
LPNs	151	135
Health Record Technicians	150	*
Teacher Aides	145	96
Boarding/Lodging Housekeepers	133	22
Job, Die Setters, Metal	125	13
Animal Caretakers	123	54
Dental Assistants	120	75
Opticians/Lens Grinders	117	14
Receptionists	112	107
Nurses Aides/Orderlies	109	84
Legal Secretaries	104	68
Lodging Quarters Cleaners	103	94
Chemical Technicians	100	*
Billing Clerks	100	52
Ushers: Recreation/Amusement	100	17

NOTE: Rates of growth in the number of job openings for a number of occupations are reported in State Employment Security Agency publications that report occupational employment projections, both statewide and for selected labor market areas of a state.

*Less than 10 openings per year.

chronically unemployed, and they are in need of job skills that will qualify them, or increase their ability to compete, for stable employment.

The cost of living has been increasing very rapidly in the SMSA even though inflation is under better control nationally. As a result, many families are required to have more than one wage earner. Although reliable statistics are difficult to obtain, the local state employment services office estimates that about 200 to 250 full-time homemakers will be entering the work force during the next year. That office also estimates that most of these persons will be without significant job skills.

During the past 12 months, several employers serving on Community College vocational education advisory and craft committees have indicated an interest in upgrading skills of some of their present employees. However, the specific kinds of training desired by these and other employers and the number of employees who might be interested in upgrading their skills are not fully known at this time.

Capacity to Meet Needs for Training

At the secondary level, there are a total of nine comprehensive high schools in the three counties. At the postsecondary level, there is Grand Community College. Vocational education programs are offered at night to adults by Expansion City public schools.

Compared to the state averages, the percentage of persons who are enrolled in vocational programs in grades 9 through 12 and in the community college is quite low. Two facts may be contributing to this state of affairs. First, the relative affluence of the SMSA has historically been associated with a large percentage of high school students making plans for college rather than for employment directly following graduation from school. Second, the rapid expansion of the school-age population has put a continuing construction and financial burden on the school systems in all three counties, especially in Grand County.

Training-related placement rates for technology programs are relatively high at the community college. About 78 percent of those completing training and seeking employment find training-related employment within three months after graduation. The lowest rate is 62 percent for the chemical technology program, whereas the highest rate is 94 percent for the electronic technology program. The training-related placement rate for all program completers at the college (excluding those in courses to upgrade existing skills) is approximately 55 percent.

The various local advisory committees for vocational education in the SMSA have indicated that vocational education programming should be expanded. Currently there are long lists of people waiting to enroll in quantity food production programs at the high schools and in the hospitality management course at Grand Community college. However, a lack of money is an important constraint in decisions that have been made by local school boards and the community college about expanding existing vocational education programs or starting new ones. The rapid growth in the elementary school-age population over the last few years has caused most of the school systems in the SMSA to give their highest priority for funding to the building and remodeling of elementary school buildings, whereas the community college's highest funding priority has been to upgrade existing vocational education equipment to keep pace with changing technologies in the workplace. The tax base in the three counties has expanded but the rising population growth and inflation leave most of the school systems in the SMSA with continuing financial difficulties.

Appendix A

Examples of Information Categories, Performance Indicators, Performance Measures, and Performance Scores

Note: The parentheses are used to denote options within a given performance measure.

Information and Data Selection Framework

Purpose	Planning Components	Information Categories	Performance Indicators
P L A N N I N G	Employment Context	Job Opportunities	Whether current demand for new workers in this occupation is sufficient for implementing a program
			Whether rate of growth is sufficient to warrant implementing a program
			Whether future demand for workers in this occupation is great enough for implementing a program

Performance Measures and Scores
(Using the Pass/Fail Normalization Procedure)

1 if the local advisory council for vocational education (or a trade association) indicates that there is, and there is likely to continue to be, a shortage of trained persons available for employment in this occupation in this labor market area (or several major labor market areas of the state) during the next 12 months (or some other time frame)
0 if the local advisory council for vocational education (or a trade association) indicates that there is not likely to be a shortage of trained persons available for employment in this occupation in this labor market area (or in several major labor market areas of the state) during the next 12 months (or some other time frame)

---

1 if the reported average annual number of job openings in this occupation is greater than the number of completers in the past 12 months (or some other time frame) from all training programs in this labor market area (or statewide) that prepare persons for this occupation
0 if the reported average annual number of job openings in this occupation is less than or equal to the number of completers in the past 12 months (or some other time frame) from all training programs in this labor market area (or statewide) that prepare persons for this occupation

---

1 if this occupation is among the 10 (or some other number) fastest growing occupations in this labor market area (or the state or nation if local data are unavailable)
0 if this occupation is not among the 10 (or some other number) fastest growing occupations in this labor market area (or the state or nation if local labor market area data are unavailable)

---

1 if the estimated number of job openings in this occupation during the next 12 months (or some other time frame) in this labor market area is greater than the estimated number of graduates from programs that prepare persons for this occupation in this labor market area
0 if the estimated number of job openings in this occupation during the next 12 months (or some other time frame) in this labor market area is equal to or less than the estimated number of graduates from programs that prepare persons for this occupation in this labor market area

---

1 if growth prospects, nationally, for this occupation are considered above average
0 if growth prospects, nationally, for this occupation are considered average or below average

---

1 if trade or business-industry associations, unions, the local vocational education advisory council, a program craft committee, or other sources indicate that there will likely be an increased demand for new workers in this occupation in this labor market area (or else statewide or nationally) because of the adoption of new technologies by firms (e.g., technicians to repair industrial robots)
0 if trade or business-industry associations, unions, the local vocational education advisory council, a craft committee, or other sources indicate that there will likely not be an increased demand for new workers in this occupation in this labor market area (or else statewide or nationally) because of the adoption of new technologies by firms (e.g., technicians to repair industrial robots)

---

1 if this occupation is new to this labor market area and the estimated number of new jobs in this occupation will be sufficient to justify implementing a training program
0 if this occupation is new to this labor market area but the estimated number of new jobs in this occupation will not be sufficient to justify implementing a training program

---

Information and Data Selection Framework

	Conditions of Employment	Whether the principles of affirmative action in hiring persons for this occupation are practiced by employers in this labor market area
		Whether employment in this occupation is generally stable
	Location of Employment	Whether jobs for program completers are likely to be conveniently located
Vocational Education Processes	Staffing	Whether staff are readily available to teach the skills required by this occupation
		Whether any new staff that are needed to provide instruction in the skills required by this occupation can be easily recruited

1 if it is known that most firms (and/or the largest firms) in this labor market area do not discriminate against persons from minority groups when hiring for jobs in this occupation
0 if it is known that most firms (and/or the largest firms) in this labor market area discriminate against persons from minority groups when hiring for jobs in this occupation, or there is insufficient evidence upon which to make a judgement about discrimination in hiring persons from minority groups

---

1 if it is known that most firms (and/or the largest firms) in this labor market area do not discriminate against physically (or mentally) handicapped persons when hiring for jobs in this occupation
0 if it is known that most firms (and/or the largest firms) in this labor market area discriminate against physically (or mentally) handicapped persons when hiring for jobs in this occupation, or there is insufficient evidence upon which to make a judgement about discrimination in hiring physically (or mentally) handicapped persons.

---

1 if it is known that most firms (and/or the largest firms) in this labor market area do not discriminate against persons with English language difficulties when hiring for jobs in this occupation
0 if it is known that most firms (and/or the largest firms) in this labor market area discriminate against pesons with English language difficulties when hiring for jobs in this occupation, or there is insufficient evidence upon which to make a judgement about discrimination in hiring persons with English language difficulties

---

1 if persons employed in this occupation in this labor market area (or statewide) typically enjoy continuing employment (i.e., layoffs in this occupation are usually very infrequent and of short duration or else virtually nonexistent)
0 if persons employed in this occupation in this labor market (or statewide) typically experience one or two layoffs each year; or the frequency of layoffs is unpredictable, but when layoffs occur, they are likely to be prolonged

---

1 if, in this labor market area (or statewide), this occupation is regarded as recessionproof (i.e., employment in this occupation is usually unaffected by even the mildest recessions or downturns in the economy)
0 if, in this labor market area (or statewide), this occupation is regarded as partially recessionproof (i.e., employment in the occupation is sometimes but not always affected by mild recessions or downturns in the economy) or vulnerable to recession (i.e., employment in this occupation is typically adversely affected by even mild recessions or downturns in the economy)

---

1 if most (or the largest) employers who hire persons for this occupation in this labor market area are located near public transportation
0 if most (or the largest) employers who hire persons for this occupation in this labor market area are not located near public transportation

---

1 if there are school staff available who can be assigned to a program to train persons for this occupation
0 if thee are either too few or no school staff who can be assigned to a program to train persons for this occupation

---

1 if there is reason to suppose that new teaching staff can be recruited for a program to train persons for this occupation
0 if there is reason to suppose that recruiting new teaching staff for a program to train persons for this occupation will be difficult, or the ability to successfully recruit is uncertain

---

		Whether staff who will be used to train students for this occupation are able to teach effectively without additional training
	Facilities	Whether a facility to train persons for this occupation presently exists or can be easily obtained
		Whether the space required to train persons for this occupation is acceptable
	Dollars	Whether the estimated start-up cost for a program to train persons for this occupation is acceptable
		Whether the estimated recurrent cost for a program to train persons for this occupation is acceptable

---

1 if staff to be assigned will likely require additional instruction to be able to teach effectively
0 if staff to be assigned will not require additional instruction to be able to teach effectively

---

1 if school-owned facilities could be used to train students for this occupation
0 if school-owned facilities could not be used to train students for this occupation

---

1 if equipment required to train persons for this occupation could be procured within the next 3 months (or some other number of months) and the cost of such equipment does not exceed the mean (or median) cost of equipment for all other training programs in this school (or would not exceed the cost of equipment required by any of the other candidate occupations)
0 if equipment required to train persons for this occupation could not be procured within the next 3 months (or some other number of months); or, even if the equipment could be procured, the cost of such equipment would exceed the mean (or median) cost of equipment for all other training programs in this school (or would exceed the cost of equipment required by any of the other candidate occupations or the mean or median for all of the other candidate programs)

---

1 if less space would be required for a training program for this occupation than the mean (or median) space used for occupational training programs in this school
0 if the spaces required for a training program for this occupation would be equal to or exceed the mean (or median) space used for occupational training programs in this school

---

1 if the space required for a training program for this occupation would be less than the space required by any of the other candidate occupations; or, the space required would be less than the mean (or median) space required by all of the other candidate occupations
0 if the space required for a training program for this occupation would be equal to or more than the space required by any of the other candidate occupations, or the space required would be equal to or more than the mean (or median) space required by all of the other candidate occupations)

---

1 if the estimated start-up cost (other than for facilities) for a typical program to train students for this occupation in this state is less than the mean (or median) start-up cost for occupational programs in this school
0 if the estimated start-up cost (other than for facilities) for a typical program to train students for this occupation in this state is equal to or greater than the estimated mean (or median) start-up cost for programs associated with all of the other candidate occupations

---

1 if the estimated recurrent cost (other than for facilities) for a typical program to train students in this occupation in this state is less than the mean (or median) recurrent cost for occupational programs in this school
0 if the estimated recurrent cost (other than for facilities) for a typical program to train students in this occupation in this state is equal to or greater than the mean (or median) recurrent cost for occupational programs in this school

---

1 if the estimated recurrent cost (other than for facilities) for a typical program to train students for this occupation in this state is less than the estimated mean (or median) recurrent cost for training programs associated with all of the other candidate occupations
0 if the estimated recurrent costs (other than for facilities) for a typical program to train students for this occupation in this state is equal to or greater than the estimated mean (or median) recurrent costs for training programs associated with all of the other candidate occupations

---

Information and Data Selection Framework

	Curriculum	Whether curriculum is available or must be developed
	Enrollment Conditions	Whether facilities to train persons for this occupation are designed to accommodate physically handicapped students
	Student Interest	Whether enrollment can be expected to be sufficient to justify implementing a program to train persons for this occupation
Vocational Education Outputs	Availability of Training Opportunities	Whether there are other institutions providing training for this occupation
	Potential Outputs	Whether the completion rate for a program to prepare persons for this occupation is likely to be favorable
Vocational Education	Potential for Placement	Whether employers have been identified who will want to hire the completers of a program that prepares persons for this occupation

---

1 if a curriculum to train students for this occupation is readily available
0 if a curriculum to train students for this occupation is not readily available and curriculum development activities will be required

---

1 if the facility that will likely be available for a program to train persons for this occupation is designed to be accessible to persons with physical handicaps
0 if the facility to be used is not designed for access by the physically handicapped

---

1 if the equipment commonly used in this occupation can be operated by physically handicapped persons as required to meet production quotas and without special modifications to the equipment
0 if the equipment used in this occupation can be operated by physically handicapped persons, but only with special modifications

---

1 if there have been sufficient requests from the general public to warrant a program for this occupation
0 if there have been either too few or no requests from the general public to warrant a program

---

1 if there has been a trend toward increased enrollments in programs to train persons for this occupation over the past few years, statewide
0 if enrollments to train persons for this occupation have remained stable, are decreasing, or tend to be unpredictable, statewide

---

1 if there are no other education agencies or institutions offering training for this occupation in this labor market area
0 if there are other agencies or institutions offering such training in this labor market area

---

1 if the completion rate, statewide, for programs at this educational level that train persons for this occupation is greater than the completion rate for the program's field (e.g., the completion rate for all vocational education programs in the health occupations field at this education level)
0 if the completion rate, statewide, for programs at this education level that train persons for this occupation is equal to or less than the completion rate for the program's field (e.g., the completion rate for all LPN programs at this education level, statewide, is equal to or less than the completion rate for all vocational education programs in the health occupations field at this education level)

---

1 if the completion rate, statewide, for programs at this education level that train persons for this occupation is greater than the completion rate, statewide, for programs at this education level that train persons for any of the other candidate occupations
0 if the completion rate, statewide, for programs at this education level that train persons for this occupation is equal to or less than the completion rate, statewide, for programs at this education level that train persons for any of the other candidate occupations

---

1 if the school has received requests from firms in the past 2 months (or some other number of months) to train persons for or upgrade the existing skills of persons in this occupation
0 if the school has not received requests from firms in the past 2 months (or some other number of months) to train persons for or upgrade the existing skills of persons in this occupation

---

Information and Data Selection Framework

Benefits	Economic	Whether the availability of persons trained for this occupation is likely to either interest firms to relocate into the local labor market area or encourage locally based firms to remain or expand their operations

1 if the state (or else a local or regional) economic development agency has received requests from one or more local employers or from employers who have expressed an interest in locating here about the availability of, or possibility of implementing, a vocational education program to train persons for this occupation

0 if the state (or else a local or regional) economic development agency has not received requests from one or more local employers or from employers who have expressed an interest in locating here about the availability of, or possibility of implementing, a vocational education program to train persons for this occupation

Information and Data Selection Framework

Purpose	Evaluation Components	Information Categories	Performance Indicators
E V A L U A T I O N	Employment Context	Job Opportunities	The extent to which current demand for new workers in this occupation is greater than the supply
			The extent to which the rate of growth in the occupation for which students are being trained warrants continuing this program
			The extent to which future demand for workers in this occupation is great enough to consider continuing this training program

Performance Measures and Scores
(Using the Range Normalization Procedure)

3 if the reported average annual number of job openings in the occupation for which students in this program are being trained is greater than the number of completers from all programs of this kind in this labor market area (or statewide) in the past 12 months (or some other time frame)
2 if the reported average annual number of job openings in the occupation for which students in this program are being trained is equal to or very nearly equal to the number of completers from all programs of this kind in this labor market area (or statewide) in the past 12 months (or some other time frame)
1 if the reported average annual number of job openings in the occupation for which students in this program are being trained is less than the number of completers from all programs of this kind in this labor market area (or statewide) in the past 12 months (or some other time frame)

---

3 if this training program prepares persons for an occupation that is among the 10 (or some other number) fastest growing occupations in this labor market area (or the state or nation if local labor market area data are unavailable)
2 if this training program prepares persons for an occupation that is not among the 10 (or some other number) fastest growing occupations in this labor market area (or the state or nation) but its rate of growth is projected as increasing
1 if this training program prepares persons for an occupation whose projected rate of growth is expected to be either constant or decline

---

3 if growth prospects, nationally, for the occupation for which students in this program are being trained are considered above average
2 if growth prospects, nationally, for the occupation for which students in this program are being trained are considered average
3 if growth prospects, nationally, for the occupation for which students in this program are being trained are considered below average

---

3 if the local vocational education advisory council (or a program craft committee, or trade association) indicates that there is likely to be a continuing shortage of trained persons available for employment in this labor market area (or in several labor market areas of the state) during the next 12 months (or some other time frame) in the occupation for which this program prepares students
2 if the local vocational education advisory council (or program craft committee or a trade association) indicates that there will likely be periodic or spot shortages of trained persons available for employment in this labor market area (or in several labor market areas of the state) during the next 12 months (or some other time frame) in the occupation for which this program prepares students
1 if the local vocational education advisory council (or program craft committee or trade association) indicates that there is not likely to be a shortage of trained persons available for employment in this labor market area (or in several labor market areas of the state) during the next 12 months (or some other time frame) in the occupation for which this program prepares students

---

		The extent to which employers' requests for trained workers in this occupation warrants continuing this training program
		The extent to which the principles of affirmative action in the hiring of persons for this occupation are practiced by employers
		The extent to which employment is stable in the occupation for which this program trains students

---

3 if more employers requested completers from this program in the past 12 months (or some other time frame) than from any other program being evaluated (or from any other occupational program in this school)
2 if the number of employers requesting completers from this program in the past 12 months (or some other time frame) exceeded the mean (or median) of the other programs being evaluated (or for all other occupational programs in this school)
1 if the number of employers requesting completers from this program in the past 12 months (or some other time frame) was equal to or less than the mean (or median) for the other training programs being evaluated (or for all other occupational programs in this school)

---

3 if it is known that most firms (and/or the largest firms) in this labor market area hiring persons for the occupation for which students in this program are being prepared do not discriminate against minority group members
2 if it is known or strongly suspected that most firms (and/or the largest firms) in this labor market area hiring persons for the occupation for which students in this program are being prepared are reluctant to hire persons from minority groups, or else there is insufficient information upon which to make a judgement about discrimination in hiring minority group members
1 if it is known that most firms (and/or the largest firms) in this labor market area hiring persons for the occupation for which students in this program are being prepared discriminate against minority group members

---

3 if it is known that most firms (and/or the largest firms) in this labor market area hiring persons for the occupation for which students in this program are being prepared do not discriminate against persons with limited English language proficiency
2 if it is known or strongly suspected that most firms (and/or the largest firms) in this labor market area hiring persons for the occupation for which students in this program are being prepared are reluctant to hire persons from minority groups, or else there is insufficient information upon which to make a judgement about discrimination in hiring persons with limited English language proficiency
1 if it is known that most firms (and/or the largest firms) in this labor market area hiring persons for the occupation for which students in this program are being prepared discriminate against persons with limited English language proficiency

---

3 if persons employed in this labor market area in the occupation for which students in this program are being prepared typically enjoy continuing employment (i.e., layoffs in this occupation are usually very infrequent and of short duration or are virtually nonexistent)
2 if persons employed in this labor market area in the occupation for which students in this program are being prepared typically experience one or two layoffs each but unemployment rarely lasts more than a few weeks
1 if persons employed in this labor market in the occupation for which students in this program are being prepared can expect layoffs that are typically frequent and/or prolonged

---

3 if, in this labor market area (or statewide), the occupation for which this program trains persons is regarded as recessionproof (i.e. employment in the occupation is usually unaffected by even the mildest recessions or downturns in the economy)
2 if, in this labor market area (or statewide), the occupation for which this program trains persons is regarded as partially recessionproof (i.e. employment in the occupation is sometimes but not always affected by mild recessions or downturns in the economy)
1 if, in this labor market area (or statewide), the occupation for which this program trains persons is regarded as vulnerable to recession (i.e. employment in the occupation is typically adversely affected by even mild recessions or downturns in the economy)

Information and Data Selection Framework

	Location of Employment	The extent to which program completers are likely to find that job openings are conveniently located
Vocational Education Processes	Expenditures	The extent of annual recurrent costs for this program
	Staffing	The extent to which staffing to operate this program is adequate
	Facilities	The extent to which facilities to operate this program are adequate
	Curricula	The extent to which this program's curriculum is adequate

3 if more than 2/3 (or some other fraction denoting a majority) of this program's completers reported (in the most recent follow-up study) that when they went looking for a job they found that most prospective employers could be reached by public transportation
2 if anywhere from 1/3 to 2/3 of this program's completers reported (n the most reent follow-up study) that when they went looking for a job they found most prospective employers could be reached by public transportation
1 if less than 1/3 of this program's completers reported (in the most recent follow-up study) that when they went looking for a job they found that most prospective employers could be reached by public transportation

---

3 if the cost of operating this program (on some comparative basis, e.g., full-time equivalent (FTE), per-student, or program basis) is less than that of any of the other programs being evaluated (or any other occupations program in this school)
2 if the cost of operating this program (on some comparative basis, e.g., FTE, per-student, or program basis) is less than the average (e.g., mean, median) comparable cost of all the other training programs being evaluated (or less than the average for all of the other occupational programs in this school)
3 if the cost of operating this program (on some comparative basis, e.g., FTE, per-student, or program basis) is more than the average (e.g., mean, median) comparable cost of all the other training programs being evaluated (or less than the average for all of the other occupational programs in this school)

---

3 if in the judgement of the vocational director or other person responsible for staff supervision there continues to be a sufficient number of qualified staff to operate this program
2 if in the judgement of the vocational director or other person responsible for staff supervision there continues to be a sufficient number of qualified staff to operate this program but not all of the staff are able to do an effective job
1 if maintaining enough staff to operate this program has been a continuing or intermittent problem

---

3 if the equipment used for this program is judged by the program's craft committee as being more than minimally adequate for preparing students for employment
2 if the equipment used for this program is judged by the program's craft committee as being minimally adequate for providing students with the kinds of job skills they will require for employment
1 if the equipment used for this program is judged by the program's craft committee as being less than minimally adequate for preparing students for employment

---

3 if this program's curriculum is judged by its craft committee as being more than adequate for providing students with the kinds of job skills they will require for employment
2 if this program's curriculum is judged by its craft committee as being minimally adequate for providing students with the kinds of job skills they will require for employment
1 if this program's curriculum is judged by its craft committee as being less than adequate or possessing serious deficiencies in specific areas for providing students with the kinds of job skills they will require for employment

---

Information and Data Selection Framework

	Enrollment Conditions	The extent to which this program has accommodated physically handicapped students
		The extent to which this program has accommodated persons with limited English-language proficiency
		The extent to which this program has accommodated educationally disadvantaged students
	Student Interest	The extent of enrollment in this program
Vocational Education Output	Trained Supply	The extent to which this program is successful in turning out completers

---

3 if there is tangible evidence that this program has made provisions for including physically (or mentally) handicapped students in training classes attended by nonphysically (or nonmentally) handicapped students
2 if there is tangible evidence that this program has made provisions for training physically (or mentally) handicapped students but not in training classes attended by nonphysically (or mentally) handicapped students
1 if there is no tangible evidence that this program has made provisions for training physically (or mentally) handicapped students

---

3 if there is tangible evidence that this program has made provisions for teaching students with limited English language proficiency and including these students in regular classes
2 if there is tangible evidence that this program has made provisions for teaching students with limited English language proficiency but not including these students in regular classes
1 if there is no tangible evidence that this program has made provisions for teaching students with limited English language proficiency

---

3 If there is tangible evidence that this program has made provisions for including educationally disadvantaged students in classes attended by non-educationally disadvantaged students
2 if there is tangible evidence that this program has made provisions for educationally disadvantaged students but only in special classes
1 if there is no tangible evidence that this program has made provisions for training educationally disadvantaged students

---

3 if the number of persons requesting enrollment in this program (as their first choice) during the past semester (or year or some other time frame) exceeded that of any other program being evaluated (or any other occupational program in this school)
2 if the number of persons requesting enrollment in this program (as their first choice) exceeds the mean (or median) enrollment for all of the other programs being evaluated (or for all other occupational programs in this school)
1 if the number of persons requesting enrollment in this program (as their first choice) is less than the mean (or median) enrollment for all of the other programs being evaluated (or for all other occupational programs in this school)

---

3 if the completion rate of this program is greater than the completion rate of any other program being evaluated (or for all other occupational programs in this school or for this type of program at this education level, statewide; or for all vocational education programs in the same program field at this education level, statewide; or for all vocational education programs at this educational level, statewide)
2 if the completion rate for this program exceeds the mean (or median) completion rate of any other program being evaluated (or for all other occupational programs in this school; or for this type of program at this education level, statewide; or for all vocational education programs in the same program field at this education level, statewide; or for all vocational education programs at this education level, statewide)
1 if the completion rate for this program is less than the mean (or median) completion rate for other programs being evaluated (or for all other occupational programs in this school; or for this type of program at this educational level, statewide; or for all programs in the same program field at this education level, statewide)

Information and Data Selection Framework

Vocational Education Outcome	Placement Experiences	The extent to which this program's completers are successful in finding employment
		The extent of time that it takes this program's completers to find employment

3 if the completer-to-enrollee ratio in this program in the last semester (or school year or some other time frame) exceeds the ratio of any other program being evaluated (or for all occupational programs in this school)

2 if the completer-to-enrollee ratio in this program in the last semester (or school year or some other time frame) exceeds the mean (or median) ratio for all of the other programs being evaluated (or for all occupational programs in this school; or for this type of program, statewide; or for all vocational education programs in the same program field at this education level, statewide; or for all vocational education programs at this education level, statewide)

1 if the completer-to-enrollee ratio in this program in the last semester (or school year or some other time frame) is less than the mean (or median) ratio for all of the other programs being evaluated (or for all occupational programs in this school; or for this type of program, statewide; or for all vocational education programs in the same program field at this education level, statewide; or for all vocational education programs at this education level, statewide)

---

3 if the percentage of persons who completed this program in the last semester (or school year or some other time frame) who found jobs in the occupation for which they were trained (or a training-related occupation) exceeds the percentage of any other program being evaluated (or for all occupational programs in this school; or for all vocational education programs in the same program field at this educational level, statewide; or for all vocational education programs at this education level, statewide)

2 if the percentage of persons who completed this program in the last semester (or school year or some other time frame) who found jobs in the occupation for which they were trained (or a training-related occupation) exceeds the mean (or median) percentage for all of the other programs being evaluated (or for all occupational programs in this school; or for this type of program, statewide; or for all vocational education programs in the same program field at this education level, statewide; or for all vocational education programs at this education level, statewide)

1 if the percentage of persons who completed this program in the last semester (or school year or some other time frame) who found jobs in the occupation for which they were trained (or in a training-related occupation) is less than the mean (or median) percentage for all other programs being evaluated (or for all occupational programs in this school; or for this type of program at this education level, statewide; or for all vocational education programs in the same program field at this education level, statewide; or for all vocational education programs at this education level, statewide)

---

3 if the mean job search time for persons who completed this program last semester (or school year or some other time frame) and who sought employment was less than that for any other program being evaluated (or of any other occupational program in this school for which such data are available; or is at least 1 standard deviation above the mean for all of the occupational programs in this school for which such data are available

2 if the mean job search time for persons who completed this program last semester (or school year or some other time frame) and who sought employment was less than the mean (or median) job search time for all of the other programs being evaluated (or exceeded the mean or median job search time of all of the occupational programs in this school for which data are available; or is between +1 and -1 standard deviation from the mean search time for all of the occupational programs in this school for which such data are available)

1 if the mean job search time for persons who completed this program last semester (or school year or some other time frame) and who sought employment exceeded the mean (or median) job search time for all of the other programs being evaluated (or exceeded the mean or median job search time of all of the occupational programs in this school for which data are available; or is more than 1 standard deviations below the mean search time for all of the occupational programs in this school for which such data are available)

Information and Data Selection Framework

Benefits from Vocational Education	Economic/Societal Benefits	The extent to which the availability of this program has been an inducement for bringing new firms into the local labor market area or encouraging existing firms to remain or expand their operations
		The extent to which this program has been responsible for reducing dependence on public assistance
	Personal Benefits	The extent to which program completers benefit in terms of salaries or wages

3 if a local- (regional- or state-) level economic development agency has requested this school to make this program available to one or more firms in order to induce them to locate in this labor market area, encourage them to remain in this area, or expand their operations and the program was made available

2 if a local- (regional- or state-) level economic development agency has requested this school to make this program available to one or more firms in order to induce them to locate in this labor market area, encourage them to remain in this area, or expand their operations but the program could not be made available to them in a timely way

1 if a local- (regional- or state-) level economic development agency has requested this school to make this program available to one or more firms in order to induce them to locate in this labor market area, encourage them to remain in this area, or expand their operations but the request was rejected

---

3 if this program trains dislocated workers or chronically unemployed or underemployed persons and the results of the most recent follow-up of program completers indicate that the percentage of completers no longer requiring public assistance exceeds the percentage of any similar programs in this labor market area

2 if this program trains dislocated workers or chronically unemployed or underemployed persons and the results of the most recent follow-up of program completers indicate that the percentage of completers no longer requiring public assistance exceeds the mean (or median) percentage for all similar programs in this labor market area

1 if this program trains dislocated workers or chronically unemployed or underemployed persons and the results of the most recent follow-up of program completers indicate that the percentage of completers no longer requiring public assistance equals or is less than the mean (or median) percentage for similar programs in this labor market area

---

3 if the results of the most recent follow-up study of program completers indicate that completers from this program finding employment in an occupation for which they were trained (or in training-related employment or both) had mean entry-level (or seniority or reentry) earnings that exceeded the mean (or seniority or reentry) earnings of any of the other programs being evaluated

2 if the results of the most recent follow-up study of program completers indicate that completers from this program finding employment in the occupation for which they were trained (or in training-related employment or both) had mean entry-level (or seniority or reentry) earnings that exceeded the mean entry-level (or seniority or reentry) earnings of all of the other programs being evaluated

1 if the results of the most recent follow-up study of program completers indicate that completers from this program finding employment in the occupation for which they were trained (or in training-related employment or both) had mean entry-level (seniority or reentry) earnings that were less than the mean entry-level (or seniority or reentry) earnings of all of the other programs being evaluated

---

Appendix B

Examples of Databases and Sources

Appendix B helps users locate sources of information to use with the information and data selection framework and to develop a context description. It focuses on four types of information: (1) the context for employment, (2) the needs of employers for trained workers, (3) the needs of people for job skills, and (4) the capacity of the education system to meet the job skill needs of employers and individuals.

The source listing format resembles a "laundry list." At first glance, there may seem to be substantial duplication among the listings. However, this approach provides a broad array of information and agency alternatives and should be especially useful for individuals at the local level who may be unfamiliar with sources of employment and education information and the agencies that collect and publish it.

Not all of the information or sources listed will be available in all geographic areas of the country. For a major urban or standard metropolitan statistical area, most, or all, of the listed information is available. In contrast, for the more rural, sparsely populated areas of the country, little of the information may be available. For this reason, as many alternative sources as possible have been included. When information is not available from one agency, some resourceful "detective" work may uncover it at another. In the end, individual administrators, planners, or evaluators are responsible for choosing the information or data. These persons will have to rely on the very best sources available in their local areas.

Source: This appendix is a modification of one found in Starr, Merz, and Zahniser (1982).

Defining the Context for Employment

Information Element	Questions to Be Answered	Information Purpose
Population Characteristics	What is the trend of population and employment growth in the community or region served by the education agency?	To indicate the approximate size of the total labor force
	What has been the trend in the age groups served by this institution?	To show the potential market for the services of particular institutions
	How do the population trends compare with the averages for the state and the nation?	To give an indication of the degree to which in- or out-migration of population is affecting the community

Defining the Context for Employment

Information Sources	Agencies Supplying Information
Annual planning report	State employment security agency
Current population report	U.S. Department of Commerce, Bureau of Census
State departments of health (bureau of vital statistics) and planning or community development agencies—data and/or studies	State departments of health and planning or community development
Regional and local planning commissions—annual reports	Regional and local planning commissions
Economically disadvantaged individuals—table 91 of the employment security automated reporting system	State employment security agency
Annual planning report	State employment security agency
State department of health (bureau of vital statistics)—data/data analysis	State department of health
Economically disadvantaged individuals—table 91 of the employment security automated reporting system	State employment security agency
Aid to families with dependent children	County welfare offices
School enrollment trends	Local education agencies
Trends from social service agency administrative data	Local social service agencies
Regional and local planning commissions—annual and/or special reports	Regional and local planning commissions
Annual planning report	State employment security agency
State department of planning and/or community development—special studies	State department of planning and/or community development
Current population report	U.S. Department of Commerce
State department of health (bureau of vital statistics)—data and/or studies	State department of health

Defining the Context for Employment

Information Element	Questions to Be Answered	Information Purpose
Economic Status and Industrial Base	What have been the area trends in unemployment?	To demonstrate whether a favorable economic climate exists for absorbing new vocational graduates and to consider effects on placement rates
	What are the significant local industries and employers in terms of location, employment, and growth?	To plot future status of employment in the community To identify sources of nonpublished information on employment trends To identify whether potential labor market problems, such as transportation, exist

Defining the Context for Employment

Information Sources	Agencies Supplying Information
Annual planning report	State employment security agency
Labor market information newsletter	State employment security agency
Affirmative action reports	State employment security agency
Characteristics of the insured unemployed—ES 203 report	State employment security agency
Demographic characteristics of those eligible for unemployment insurance and registered with the state employment agency—table 8 of the employment security automated reporting system	State employment security agency
Characteristics of the insured unemployed—ES 203 report	State employment security agency
Chamber of commerce—data or special studies	Local chambers of commerce
Local- and state-level economic or industrial development commissions—data and/or studies	Local- and state-level economic or industrial development commissions
Industrial realtors—information and/or data	Local industrial realtors
University departments of business and/or economic research; regional, multistate councils of government, and employer associations—data and special studies	Colleges and universities in the state (or surrounding states), multistate councils of government, and local employer associations
Tax records, if local wage taxes are collected	Local tax offices
Annual planning report	State employment security agency
County business patterns	U.S. Department of Commerce
Labor market information newsletter	State employment security agency
State department of industrial development—directory of major manufacturers	State department of industrial development
Local chambers of commerce and regional and local planning commissions—data or special studies and employer directories	Local chambers of commerce and regional and local planning commissions
State and area projections from the occupational employment statistics program	State employment security agency
Employment service 202 Report	State employment security agency

Assessing the Needs of Employers for Trained Workers

Information Element	Questions to Be Answered	Information Purpose
Demand for Trained Workers	What are the growth and decline patterns in the mix of occupations and industries?	To determine industries and occupations that are expanding and will have chronic or crucial needs for workers
	What are estimates of demand for new workers, by occupation, requiring less than a bachelor's degree?	To identify the potential size of the market for vocational education

Assessing the Needs of Employers for Trained Workers

Information Sources	Agencies Supplying Information
Annual planning report	State employment security agency
Employment service 202 reports	State employment security agency
Employment service 790 series—current employment statistics program	State employment security agency
Labor market information newsletter	State employment security agency
County business patterns	U.S. Department of Commerce
Economic censuses	U.S. Department of Commerce, Bureau of Census
State and area projections from the occupational employment statistics program	State employment security agency
Decennial census (for states and standard metropolitan statistical areas with a population of 250,000 or more)	U.S. Department of Commerce, Bureau of the Census
Openings received and filled by industrial division and occupational category—table 10-A of the employment security automated reporting system	State employment security agency
Special studies about the mix of an area's occupations and industries	State and local industrial or economic development commissions, chambers of commerce, regional planning commissions, and universities
State plan for vocational education	State division of vocational education
Annual planning report	State employment security agency
Table 96 of the employment security automated reporting system	State employment security agency
Job bank openings summary	State employment security agency
JOBFLO data	State employment security agency
State industry-occupation matrix from the occupational employment statistics program	State employment security agency
Decennial census publications	U.S. Department of Commerce
Employer surveys	Chambers of commerce, planning commissions, JTPA sponsors, university research projects, employer associations
Help-wanted ads	Local newspapers
Occupational projections and training data	U.S. Department of Labor, Bureau of Labor Statistics

Assessing the Needs of Employers for Trained Workers

Information Element	Questions to Be Answered	Information Purpose
	What has been the pattern of demand for vocational education by employers to train current employees?	To assess the potential for developing special vocational programs for upgrading or retraining workers
Supply of Trained Workers	What are estimates of training supply, by occupation, to meet demands for new workers?	To help identify potential avenues for providing vocational instruction

Assessing the Needs of Employers for Trained Workers

Information Sources	Agencies Supplying Information
Contacts with local employers: determine current upgrading/retraining methods; training suppliers currently utilized; occupations for which training needs for current employees; satisfaction with hiring vocational education graduates	Local private employers
Contacts with state occupational licensing bureaus and other training groups to determine areas of training shortfalls	State bureaus of occupational licensing
Contacts with employer associations and employee groups (unions) to determine upgrading and retraining needs	Local employer associations and employees groups
Table 96 of the employment security automated reporting system	State employment security agency
Vocational education data and reporting system	State division of vocational education
Higher education general information survey	National center for education statistics
National Center for Education Statistics: postsecondary career school survey	National center for education statistics
Contacts with representative of state bureau of system	State bureau of vocational rehabilitation
Work incentive program completions—employment security automated reporting system	State employment security agency
Occupational projections and training data	U.S. Department of Labor, Bureau of Labor Statistics
Job corps centers	Local centers or U.S. Department of Labor
Contacts with and data from local proprietary schools and community or junior colleges	Local proprietary schools and community colleges; state agency responsible for community and junior colleges
Contacts with local employers (especially for information about unregistered local apprenticeship programs)	Local private employers
Employment service 203 report—unemployment by occupations for standard metropolitan statistical areas	State employment security agency

Assessing the Needs of Employers for Trained Workers

Information Element	Questions to Be Answered	Information Purpose
	What are the sources of supply in this community and region?	To account for effects of other vocational education institutions and related agencies in the community and the region
Supply-Demand Balance	What occupations have a large estimated supply-demand gap, either by numbers or by production?	To identify gaps that could conceivably be filled by vocational education
	What occupations have job openings for trained persons?	To provide supplementary information to assist in identification of shortfalls

Assessing the Needs of Employers for Trained Workers

Information Sources	Agencies Supplying Information
Listing of proprietary schools (for locations of schools)	State agency responsible for proprietary school education and licensing
Local school belonging to the National Association of Trade and Technical Schools	National Association of Trade and Technical Schools, Washington, D.C.
Contacts with employer associations and employees groups (locations of in-house or employer-sponsored training programs)	Local employer associations and unions
Listing of colleges and universities	State department of higher education
Contacts with state bureau of apprenticeship and training representative; state bureau of vocational rehabilitation; and bureaus of occupational licensing (location of training programs)	State bureau of apprenticeship and training, bureau of vocational rehabilitation
Local telephone directories	
Directories of local schools offering vocational education	State division of vocational education
Annual planning report	State employment security agency
State plans for vocational education	State division of vocational education
Table 96 of the employment security automated reporting system	State employment security agency
Locally developed estimates based on local supply-demand matrices, along with other selected criteria	Local planning commissions, chambers of commerce, local education agencies, university research projects
Occupational projections and training data	U.S. Department of Labor, Bureau of Labor Statistics
Annual planning report	State employment security agency
Job bank openings summary	State employment security agency
JOBFLO data	State employment security agency
Local survey already conducted	Local vocational education agencies, chambers of commerce, civic improvement association, employer association, junior or community college, local private employment agencies

Assessing the Needs of Employers for Trained Workers

Information Element	Questions to Be Answered	Information Purpose
	What are the apparent causes of any significant estimated or reported shortages of trained workers?	To provide supplementary information to assist in identification of shortfalls

Assessing the Needs of Employers for Trained Workers

Information Sources	Agencies Supplying Information
Contacts with local advisory councils	Local education agencies and community colleges
Contacts with industrial or economic development commissions	State and local economic/industrial development commissions
Contacts with state occupational licensing bureaus and other employer groups	Employer groups, state occupational licensing bureau
Help-wanted ads	Local newspapers
Private employment agencies—special survey	Local private employment agencies
Labor turnover statistics programs	State employment security agency
Occupational wage rates based on data from table 7B of the employment security automated reporting system, and job bank and JOBFLO data	State employment security agency
Bureau of labor statistics area wage surveys	U.S. Department of Labor, Bureau of Labor Statistics
Employer requirements for worker education and experienced based on JOBFLO data	State employment security agency
Employer job descriptions	Local private employers
Seasonal employment trends based on data from the current employment statistics program of the bureau of labor statistics 790 program	State employment security agency
Selected employer interviews to determine working conditions, promotability within the firm, and job requirements	Local private employers
Occupational outlook handbook	U.S. Department of Labor
Dictionary of occupational titles	U.S. Department of Labor
Occupational projections and training data	U.S. Department of Labor, Bureau of Labor Statistics
Contacts with state occupational licensing bureaus, labor unions, and employer associations	State occupational licensing bureaus, local labor unions, and employer associations
Worker interviews with vocational education completers working in specific occupations to determine perceptions about job satisfaction and working conditions	Completers of vocational education programs

Assessing the Needs of Employers for Trained Workers

Information Element	Questions to Be Answered	Information Purpose
Hiring characteristics	What occupations appear to offer the largest number or proportion of job openings to fresh graduates of vocational programs?	To reduce the possibility of producing skilled people who won't be hired
	How are vocational education completers perceived by employers in comparison with potential workers from other training sources?	To determine whether vocational education is seen as a viable source to help fill employment gaps

Assessing the Needs of Employers for Trained Workers

Information Sources	Agencies Supplying Information
Contacts with local proprietary schools, community and junior colleges, and public vocational schools—placement and/or follow-up reports	Local proprietary schools, community and junior colleges, and public vocational schools
State divisions of vocational education	State division of vocational education
JOBFLO data	State employment security agency
Help-wanted ads	Local newspapers
Local vocational school—employer follow-up surveys to determine satisfaction with vocational graduates	Local public vocational schools, State department responsible for vocational and technical education

Assessing the Needs of People for Job Skills

Information Element	Questions to Be Answered	Information Purpose
Economic Needs	What proportion of the population can be described as economically disadvantaged?	To determine the extent of the need for vocational education as an economic improvement program
	What groups or subpopulations are suffering economic hardship?	To evaluate whether potential programs need to be focused toward particular groups of clients
Employment Needs	What segments of the population are most affected by unemployment?	To describe the needs of individuals for skills that will enable them to obtain stable employment
	What proportion of the population is employed in jobs that appear to be sexually or racially stereotyped?	To what extent do individuals training to be able to move out of occupational "ghettos"?

Assessing the Needs of People for Job Skills

Information Sources	Agencies Supplying Information
Annual planning report	State employment security agency
State department of planning and/or community development—data and reports	State department of economic or community development
Decennial census publications	U.S. Department of Commerce, Bureau of the Census
Annual planning report	State employment security agency
Table 91 of the employment security automated reporting system	State employment security agency
Decennial census publications	U.S. Department of Commerce, Bureau of the Census
Administrative data from social service agencies (welfare, offices of aging, bureau of vocational rehabilitation, drug and alcohol abuse centers)	Local social service agencies
County extension agents in rural areas	County extension agents
Affirmative action report	State employment security agency
Regional, county, or local planning commissions—data, or special reports	Regional, county, and local planning commissions
Annual planning reports	State employment security agency
Affirmative action reports	State employment security agency
Table 91 of the employment security automated reporting system	State employment security agency
The ES 203 report for selected standard metropolitan statistical areas	State employment security agency
Special labor force estimates, studies on youth employment	State employment security agency
Decennial census publications	U.S. Department of Commerce, Bureau of Census
Placement and follow-up reports	State division of vocational education and local training institutions
Affirmative action reports	State employment security agency
Occupational outlook quarterly; publications of the women's bureau, U.S. Department of Labor; handbook of labor statistics, U.S. Department of Labor, bureau of labor statistics	U.S. Department of Labor

Assessing the Needs of People for Job Skills

Information Element	Questions to Be Answered	Information Purpose
Educational/Skill Needs	What proportion of the labor force has inadequate education levels?	To show the need for vocational education as a credential to help overcome employment barriers
	What are the needs for vocational education expressed by underemployed persons?	To ascertain potential interest of persons in programs to improve their labor market potential

Assessing the Needs of People for Job Skills

Information Sources	Agencies Supplying Information
Decennial census publications	U.S. Department of Commerce, Bureau of the Census
Public school dropout data	State department of education
Table 91 of the employment security automated reporting system	State employment security agency
Administrative client assessment data	Bureau of vocational rehabilitation and other social service agencies
Guidance counselor information	Local public schools

Assessing System Capacity to Meet the Needs of Employers and Students

Information Element	Questions to Be Answered	Information Purpose
Institutional Description	What kinds of institutions offer programs of instruction in vocational education?	To develop an inventory of local providers of vocational education
	What types of facilities are available for the vocational program?	To assess the capacity of local education agencies in terms of space and enrollment potential

Assessing System Capacity to Meet the Needs of Employers and Students

Information Sources	Agencies Supplying Information
State directory of local education agencies offering vocational education	State division of vocational education
State directory of proprietary schools	State division of vocational education
National Association of Trade and Technical Schools—school catalogue	National Association of Trade and Technical Schools, Washington, D.C.
Encyclopedia of associations	Local libraries
State bureaus of occupational licensing (locations of accredited training programs)	State bureaus of occupational licensing
Yearbook of higher education	Local libraries
Programs and schools: a supplement to the directory of postsecondary schools with occupational programs	Local libraries
Technician education yearbook	Local libraries
State directories of universities, community colleges, and technical institutes	State department responsible for higher and junior college education
State representative of bureau of apprenticeship and training (locations of local, registered programs)	State bureau of apprenticeship and training
Local hospitals for specialized medical training	Local hospitals
Employer associations for employer in-house training programs	Local employer associations
Reports on enrollment capacity, spacing and equipment from local public schools, junior or community colleges, and other training institutions	Local schools, junior or community colleges, and other local training institutions
Facilities and equipment information	State department of education, state division of vocational education
Higher education data survey	State department of higher education or National Center for Education Statistics

Assessing System Capacity to Meet the Needs of Employers and Students

Information Element	Questions to Be Answered	Information Purpose
Program Description	What is the range of occupational programs offered at each institution?	To describe the total range of vocational options available in the area
	What are the employment objectives of instructional programs at each institution?	To determine which institutions are involved in specific job preparatory instruction rather than career orientation, exploration, retraining/upgrading, and so forth
Student Body	At each institution, what are the levels of enrollment (and trends) in vocational programs?	To indicate the trends in student interest toward various types of programs
	What are the patterns of completion of vocational programs, by occupational area?	To provide estimates of occupational supply

Assessing System Capacity to Meet the Needs of Employers and Students

Information Sources	Agencies Supplying Information
Catalogues from local community colleges or technical institutes	State department responsible for community colleges and technical institutes
Contacts with directors of occupational planning or institutional planning at community colleges or technical institutes	Local community colleges and technical institutes
Catalogues or brochures from proprietary schools or contacts with administrative staff	Local proprietary schools
Vocational education data and reporting system	State division of vocational education
Directors of local Job Corps centers	Job Corps centers
Training directors—local hospitals and military installations	Local hospitals and military installations
State bureau of apprenticeship and training—listings of local programs	State bureau of apprenticeship and training
Contact with directors of sheltered workshop programs	Local sheltered workshops
Contacts with a knowledgeable person in each training institution (e.g., training directors, institutional planners, instructors, school administrators, recruitment specialists)	Local training institutions
nal education data and reporting system	State division of vocational education
Enrollment records	Local community and junior colleges directly responsible or state department responsible for higher education
National Center for Education Statistics—postsecondary career school survey	National Center for Education Statistics
Enrollment records—local community and junior colleges, local proprietary schools, apprenticeship programs, local sheltered workshops, Job Corps centers, and any other local training groups	Local community and junior colleges, proprietary schools, state bureau of apprenticeship and training, local sheltered workshops, local Job Corps centers (or state department of labor), and other training institutions
Vocational education data and reporting system—follow-up component	State division of vocational education
Completion and/or follow-up reports local community or junior colleges and proprietary schools	Local community and junior colleges (or state department responsible for higher education), local sheltered workshops
Job Corps centers completion records	U.S. Department of Labor, employment and training administration or local centers

Assessing System Capacity to Meet the Needs of Employers and Students

Information Element	Questions to Be Answered	Information Purpose
	What are the age, socioeconomic, and employment characteristics of students enrolled in training?	To determine what types of persons are in fact being served by local institutions
	What are typical entrance requirements to vocational education programs?	To determine how accessible programs are to persons of differing ability levels
Financial Status	What have been the trends in funds available for operational expense of vocational education?	To show potential for expansion of program offerings

Assessing System Capacity to Meet the Needs of Employers and Students

Information Sources	Agencies Supplying Information
Vocational education data and reporting system	State division of vocational education
Individual school and class reports	Local schools and training instructors
Individual community and junior college institutional records and reports	Local colleges; state department of education and/or higher education
Higher education general information survey	National center for education statistics
Student body reports	Local proprietary schools
Job Corps centers—student body reports	Local centers
Student body reports from sheltered workshops	Local sheltered workshops
Vocational rehabilitation management information system	State bureau of vocational rehabilitation
State plans for vocational education	State division of vocational education
Contacts with local vocational school administrators, vocational guidance counselors, or individual instructors	Local vocational education agencies
Catalogues from junior and community colleges	Local community and junior colleges
Catalogues or brochures from local proprietary schools	Local proprietary schools
Contacts with state bureaus of occupational licensing	State bureaus of occupational licensing
Contacts with admissions specialists, recruiters, or counselors at community colleges, proprietary schools, and other training institutions	Local training institutions
State plan for vocational education	State division of vocational education
Local school budgets and financial reports	Local schools
Higher education general information survey	State department responsible for higher education; state occupational information coordinating committee (SOICC) director; National Center for Education Statistics
State budget legislative reports	State agency responsible for fiscal matters

Assessing System Capacity to Meet the Needs of Employers and Students

Information Element	Questions to Be Answered	Information Purpose
	What is the availability of funds for capital expenses (facilities, equipment) in vocational education?	To show potential for capital and equipment expenditures

Assessing System Capacity to Meet the Needs of Employers and Students

Information Sources	Agencies Supplying Information
Local school equipment inventory expense records	Local schools
State plans for vocational education	State division of vocational education
State education agency budget allocations for facilities and equipment	State department of education, state division of vocational education, state department responsible for higher education
Local school district budget records and reports	School district administrative offices

Appendix C

Members of the Review Panel

Panel Member	Institution
Harold Carr	Great Oaks Joint Vocational School District, Cincinnati, OH
Michael Bailis	Cuyahoga Community College, Cleveland, OH
Terrance Greenwood	Wicomico County School System, Salisbury, MD
Clyde Hornberger	Berks Vocational-Technical School, Berks County, PA
Cliff Migal	Great Oaks Joint Vocational School District, Cincinnati, OH
Scott Parks	Berks Vocational-Technical School, Berks County, PA
John Perrin	Cleveland Public Schools, Cleveland, OH
Robert Runkle	Berks Vocational-Technical School, Berks County, PA
John Wahle	Great Oaks Joint Vocational School District, Cincinnati, OH
Edric Weld	Cleveland State University, Cleveland, OH

References

Drewes, D.W., and Katz, D.S. *Manpower Data and Vocational Education*. Raleigh, NC: Center for Occupational Education, North Carolina State University, 1975.

Franchak, S. *Factors Influencing Vocational Education Program Decisions*. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1983.

Michigan Vocational Education Resource Center. "Using Data to Make Decisions." Program Review/ Planning, Lansing, MI: Michigan State Board of Education, n.d.

National Occupational Information Coordinating Committee. *Occupational Information System (OIS) Handbooks*. Washington, DC: The National Occupational Information Coordinating Committee, 1981.

Starr, H.; Merz, H.; and Zahniser, G. *Using Labor Market Information in Vocational Planning*. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Starr, H.; Dunham, D.; Woolf, W.; and Harris, J. *Developing State Plans for Vocational Education*. Columbus,OH: The National Center for Research in Vocational Education, The Ohio State University, 1976.

Starr, H.; Maurice, C.; Black, M.S.; and Keller, P. *Selecting, Analyzing, and Displaying Planning Information*. Columbus OH: The National Center for Research in Vocational Education, The Ohio State University, 1979.

Starr, H.; Maurice, C.; Merz, H.; and Zahniser, G. *Coordination in Vocational Education Planning: Barriers and Facilitators*. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1980.

Starr, H.; Cohen, S.; Merz, H.; Campbell-Thrane, L.; and Jahnke, J.J. *Conditions Affecting Vocational Education Planning*. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1981.

Young, R.C. *Vocational Education Planning: Or Making Do with Imperfect Data*. Columbus, OH: The Center for Vocational and Technical Education, The Ohio State University, 1973.

TO ORDER ADDITIONAL COPIES OF THIS PUBLICATION, USE--	ORDER NUMBER	PRICE
• *Increasing Vocational Program Relevance: A Data-Based Approach*	RD 264	$10.50

TO ORDER RELATED PUBLICATIONS, REFER TO–

• *Toward Excellence in Secondary Vocational Education: Using Evaluation Results*	IN 294	$4.75
• *Toward Excellence in Secondary Vocational Education: Elements of Program Quality*	IN 291	$4.75
• *Using Evaluation Results: Guidelines and Practices for Using Vocational Evaluation Effectively*	RD 212	$6.25
• *Using Labor Market Information in Vocational Planning*	RD 228	$8.75
• *Coordination in Vocational Education Planning: Barriers and Facilitators*	RD 187	$3.80
• *Selecting, Analyzing, and Displaying Planning Information*	RD 164	$9.75

ORDERING INFORMATION

To order additional copies, please use order number and title. Orders of $10.00 or less should be prepaid. Make remittance payable to the National Center for Research in Vocational Education. Mail order to:

The National Center for Research
in Vocational Education
National Center Publications, Box F
1960 Kenny Road
Columbus, Ohio 43210-1090

Prices listed are in effect at the time of publication of this book. All prices include postage and handling. Prices are subject to change without notice.

Quantity Discounts
Orders of five (5) or more items, as listed by publication number and title, with a total dollar value for the order of:

$ 50 to $100, the discount is 5%
$101 to $200, the discount is 10%
$201 to $300, the discount is 15%
$301 to $400, the discount is 20%
$401 and above, the discount is 25%

International Orders
All orders, in any amount, from outside the United States and its possessions are to be paid in U.S. currency. Additional postage and handling charges may be added for foreign shipments if necessary.